IDENTIFICATION OF FLOW PATTERNS FOR COARSE PARTICLES TRANSPORTED IN A NON-NEWTONIAN CARRIER USING ELECTRICAL RESISTANCE TOMOGRAPHY

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Declaration

I declare that this research dissertation is my own unaided work. It is being submitted for the MTech Degree at Cape Peninsula University of Technology, Cape Town. It has not been submitted before for any degree or examination in any other University.

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(Signature)

Signed in Cape Town this 10th day of October 2012

Abstract

Flow features provide considerable guidance for the rational selection of techniques to predict hydraulic behaviour and for suitable operating conditions for pipelines. Traditionally, water was used to transport coarse particles, and it was necessary to operate at velocities at which the flow was turbulent in order to avoid blockage. Consequently the friction losses were too high for economic operation. In addition, wear on pipes, fittings and pumps presented serious problems. Nowadays, it is well established that it is possible to operate at very high solids concentration in a heavy vehicle (carrier fluid). Similar solids throughputs may be achieved at very much lower velocities by operating in the laminar flow regime. This results not only in lower power requirement, but it also reduces wear and water consumption. In spite of these potential benefits, only a few studies dealing with the transport of coarse particles in heavy media have been reported.

Since the distinction between different flow patterns is of paramount importance for modelling purposes, as equations are flow pattern dependent, and given the importance of avoiding excessive wear of pipes at low and high velocities, the present work was carried out in the context of dense or non-Newtonian carrier fluid. This project comprised analysis of existing data acquired at the Flow Process and Rheology Centre of the Cape Peninsula University of Technology. Kaolin in the range of 6% to 15% volumetric concentration was used as a carrier fluid and coarse material in the range of 10% to 30% volumetric concentration was simulated by silica sand ranging in size from 1 mm to 3 mm. For the purpose of this study flow patterns derived from resistance curves for various mixtures, particle concentrations, particle grading and flow conditions were compared with “concentration profiles” and images obtained from electrical resistance tomography (ERT).

It appeared from this work that the sand concentration does not change the flow pattern but increases or reduces the pressure gradients depending on the case. The concentration of kaolin carrier can change the flow patterns from layered to homogeneous flow, inducing an increase in total pressure gradients as it increases. Flow patterns obtained from ERT compared reasonably well with those derived from pressure gradients profiles. The transition velocities from layered to heterogeneous flow obtained from both methods were similar, especially for low and moderate carrier concentrations. As the kaolin carrier concentration or as the sand concentration increased it became more difficult to distinguish the transition velocity between heterogeneous and layered flow. More work is still needed to improve the ERT instrument and its image reconstruction software.

Dedication

This dissertation is dedicated to:

The memory of my mother Marcelline Tshiama Kanyiki who passed away on the 11/12/2010 and my son Patient Mutombo Kabengele who passed away in 2006

My wife Billy Bilonda and my sons Dereck Tshiyamba and Jared Ntambua Kabengele – for their love and emotional support

My father Potien Mutombo Bukole

My brother Fortune Muluilayi – for his support

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Nomenclature

List of symbols

A	Area of the internal cross-section of the pipe (m^2)
C_v	Volumetric concentration of solids (%)
D	Pipe internal diameter (m)
ΔD	Absolute error in pipe internal diameter (m)
d	Particle diameter (m)
d_{50}	Median particle size diameter (m)
F	Applied force (N)
F_L	Dimensionless factor for Durand's correlation
f	Fanning friction factor (-)
f_w	Friction factor associated with the liquid component of the slurry
G	Pressure gradients over a distance L (Pa/m)
ΔG	Absolute error in pressure gradient (Pa/m)
g	Acceleration due to the gravity (m/s^2)
Δh	Differential Pressure in metre of liquid (for example water)
K	Fluid consistency index ($Pa.s^n$)
k_r	Pipe absolute roughness (m)
L	Pipe Length (m)
M_w	Mass of water (kg)
m	Measured quantity (for example pressure, flow rate, etc.)
Δm	Error in the quantity measured
n	Flow behaviour index (-)
n'	Slope of the log-log graph of wall shear stress vs. shear rate (-)
N	Number of experimental points
P	Pressure (Pa)
ΔP	Differential pressure (Pa)
Q	Flow rate (m^3/s)
ΔQ	Absolute error in flow rate (m^3/s)
r	Radius of a fluid element flowing in a pipe (m)
R	Pipe internal radius (m)
Re	Reynolds number (-)
Re_p	Particle Reynolds number (-)
S	Relative density of solids (-)

U_l^*	Liquid friction or velocity, defined as $\sqrt{\frac{\tau_o}{\rho_l}}$ or $V\sqrt{\frac{f_w}{2}}$ (m/s)
$\frac{du}{dy}$	Velocity gradient in y-direction
V	Velocity (average value in m/s) of the mixture
ΔV	Absolute error in velocity (m/s)
V_c	Critical or transition velocity between bed flow and fully suspended flow. Here no distinction is made between stationary and moving beds
V_{dep}	Limit deposit velocity or transition velocity between heterogeneous and moving bed flow pattern
$V_{m,dep}$	Minimum deposition velocity or transition velocity between moving bed and stationary bed flow
V_{susp}	Suspending or homogeneous velocity. It is a transition velocity between homogeneous and heterogeneous flow
V_t	Particle terminal settling velocity (m/s)
$\overline{V}$	Average magnitude of a signal
V_i	i^{th} measurement of the magnitude of a signal
V^*	Measured voltage (V)
X	Overall result or function of several variables or measurements
ΔX	Error in the overall result

Greek letters

$\dot{\gamma}$	Shear rate (s^{-1})
η_s	Normalised slurry conductivity (-)
μ	Newtonian or dynamic viscosity (Pa.s)
μ_l	Dynamic viscosity of liquid phase (Pa.s)
ρ	Density (kg/m^3)
ρ_l and ρ_s	Density of liquid and solid phases respectively
ρ_w	Density of water (kg/m^3)
σ_{so}	Slurry conductivity at the initial condition
σ_w	Conductivity of the conductive phase (liquid phase)
τ	Shear stress (Pa)
τ_o	Shear stress at the pipe wall (Pa)

τ_{rz}	Shear stress on a fluid element of radius r flowing in z direction inside a pipe
τ_y	Yield stress (Pa)
ϕ	Apparent solids concentration
ϕ_i	i^{th} measurement of the apparent solids concentration
ϕ_M	Average of apparent solids concentration
ϕ_s	Standard deviation of the apparent solids concentration

Subscripts/superscripts

exp	Experimental
calc	Calculated

Terms and concepts

Term	Definition
Coarse particles:	Particles that are too large to participate in the flocculation process (Gillies, Hill, McKibben & Shook, 1999).
d56_k06ss1sc10:	Mixture of 10% volumetric concentration of 1 mm sand size and 6% volumetric concentration of kaolin used as carrier fluid. The mixture is transported in 56 mm pipe diameter. A similar notation is used for the other mixtures.
ERT:	Electrical Resistance Tomography. It is a technique for imaging sub-surface structures from electrical measurements made at the surface. In the case of a slurry flowing in a pipe, these measurements are taken at the internal surface of the pipe by means of electodes mounted symmetrically in boreholes around the pipe.
Friction losses:	Energy dissipation due to collision between fluid particles or between fluid particles and pipe wall, also referred to as pressure drop, head losses, pressure losses or pressure gradients in the literature.
Flow pattern:	Flow regime or flow feature for settling slurries. It shows how the solids are distributed within the pipe (El-Nahhas, Rayan, El-Sawaf & El-Hak, 2008).
Laminar flow:	Streamline flow or flow in which fluid layers glide relative to each other (Shook & Roco, 1991).
Layered flow:	Moving-bed flow or flow in which solid particles settle out, form a bed and move in the flow direction by sliding, rolling or saltation.
Non-Newtonian fluid:	Fluid shear stress vs. shear rate relationship is non-linear or does not pass through the origin (Chhabra & Richardson, 2008).
Rheogram:	Flow curve or plot of shear stress vs. shear rate.

Settling slurry:	Slurry in which solid particles are not constantly maintained in suspension and have a tendency to settle or fall under the influence of gravity (King, 2002).
Superficial velocity:	Hypothetical or artificial fluid velocity calculated as if the given phase or fluid were the only one flowing in a given cross-sectional area, other phases present in the channel being disregarded.
Turbulent flow:	Flow with rapid mixing of neighbouring fluid elements (Shook & Roco, 1991).
Vehicle:	Carrier fluid.
v/v:	Volumetric concentration of slurry in solid particles. It is expressed as a ratio of the volume of solids to the total volume of the mixture.

Chapter 1 Introduction

This chapter provides the background of the research problem, with the need for the determination of flow patterns being highlighted. It also shows the objectives and the methodology used in this project and how the dissertation unfolds.

1.1 Background and Motivation

Many models have been developed over the years to try to simulate two-phase flows, starting from the equivalent liquid flow model and empirical correlations (i.e. the headloss relationship developed by Durand & Condolios (1952) for the flow of non-depositing heterogeneous slurries) to layered models. These models depend on the flow behaviour inside the pipe. Hence, knowledge of flow patterns is of prime concern for the correct utilisation of these models since accurate prediction of friction losses results in improved design procedures and energy saving. The design of piping and pumping systems for various industries requires a knowledge of the friction (head, pressure or energy) losses in the pipes and a good understanding of flow pattern of the fluid being transported. When settling slurry is transported, significant gradients in the solids concentration develop under the influence of shear and gravity. The transported particles frequently strike the walls and in so doing dissipate some of their kinetic energy. These processes ensure a continuous exchange of momentum between the fluid and the walls, between the fluid and the particles and between the particles and the wall (King, 2002).

Several studies that have been undertaken so far in the field of slurry handling focussed on turbulent flow of particles small enough to maintain 'homogeneity'. This 'non-settling slurry' flows as a single–phase fluid, exhibits non-Newtonian behaviour and is characterised by a uniform concentration profile of particles with respect to the axis of the pipe. This flow behaviour is ideal but does not exist in practice when coarse particles are present (settling slurries). Fluid and solids maintain their separate identities and the concentration profile is non-axisymmetric. Even the simplest suspension flows are subject to the stratification caused by forces exerted on suspended particles (the dispersed phase) in the direction normal to the flow. If these forces are not opposed by dispersed phase stresses, this stratification ultimately leads to separation of the whole flow domain into a region containing close-packed particles and one depleted of particles (Buyevich, 1999).

Many researchers observing two-phase flow patterns and using different methods came up with different results for the same type of flow. The reason for this was methods used for flow pattern detection. Results were obtained using various methods, undefined calibration procedures and the validation processes, which were difficult to analyse and compare (Kolar & Keska, 2002). In order to avoid these problems, Kolar and Keska (2002) undertook a study in which a set of four techniques for flow pattern determination (i.e. capacitive, resistive, pressure and optical methods) were employed and compared. Their parameter of study was the root mean square (RMS) values of the magnitude of the measured signal vs. in-situ spatial concentrations for all four measurements systems employed and for each flow condition. In their experiment a two-phase water-air mixture was used and data were simultaneously collected (using the four techniques) in the same space and time from a transparent vertical channel measuring 35 mm in diameter.

One way to assess the ability of the individual methods was by comparing the sensitivity to the change of flow pattern. The absolute value of the RMS and the slope of the curve directly define the sensitivity over a given range. The steeper the curve, the better the capability to determine the flow pattern. The comparison of the four methods used in recognition of flow patterns led to the conclusion that the pressure system is more sensitive than the optical method at flows with lower average concentration but least sensitive for flows with high average concentration. After the pressure system, both capacitive and resistive systems were the next most sensitive system. The RMS curve of both resistive and pressure systems have shown concomitance with each other (Kolar & Keska, 2002).

Giguère, Fradette, Mignon and Tanguy (2008) carried out a study on characterisation of slurry flow regime transitions by electrical resistance tomography (ERT). Transition between slurry flow regimes can be determined from tomogram analysis. However, the identification of transitions from the image only remains subjective, particularly for the transition from a homogeneous to a heterogeneous slurry flow (Giguère *et al.*, 2008). For this reason, Giguère *et al.* (2008) developed a strategy for the direct interpretation of ERT measurements to identify homogeneous and heterogeneous slurry flow regimes, without the need for image reconstruction. Assuming a homogeneous distribution, the average of the measurements provides an estimation of the apparent concentration of slurry. The hypothesis of a homogeneous distribution can be verified by computing the standard deviation of the apparent concentration. A large standard deviation indicates a heterogeneous distribution while a zero value indicates a homogeneous distribution. However, a zero value can be reached only with an ideal sensor having identical electrodes mounted in perfectly symmetric position in the sensor ring. Similar to the standard deviation of the apparent concentration, the standard deviation of normalised differences from the average values of resistance was defined and its large value suggests unsymmetrical conductivity distribution, while a small value would indicate a symmetric distribution. In the experiment conducted by Giguère *et al.* (2008), the slurry consisted of a mixture of tap water and non-conductive glass beads of 100 µm in diameter with a density of 2500 kg/m^3. The average flow velocities ranged from 0.22 to 2.2 m/s and four bulk concentrations (5; 10; 15 and 20% v/v) were tested.

From the above considerations it appears that recognition of flow patterns of coarse particles in heavy media or non-Newtonian carrier fluids has not been thoroughly investigated.

1.2 Research problem

Accurate prediction of pressure losses for settling slurries transported in a pipe is lacking due to inappropriate flow patterns being assumed. As part of the solution to this problem, the present study was carried out to address the identification of flow patterns of coarse particles in non-Newtonian carrier fluids.

1.3 Research Question

Flow behaviour of settling slurries needs to be appropriately determined. Therefore, the following questions were addressed in this work:

- How do the carrier concentration, the solid particles concentration, the solid particles size and the superficial velocity affect the flow patterns?
- To what extent do the concentration profiles obtained from a locally manufactured ERT system compare to frictional loss profiles in determining the flow behaviour of settling slurries?

1.4 Objectives and outcomes

The aim of this work was to use an ERT system to detect flow patterns for a range of mixtures with various carrier concentrations, sand concentrations and sand sizes at superficial velocities of 0.5 to 5 m/s. In order to achieve this, the following objectives were met:

- Measuring pressure gradients and flow rates for the various mixtures.
- Extracting and evaluating pipe centreline concentration profiles from ERT data at different velocities.
- Determination of the excess pressure gradients due to the presence of coarse solid particles, noting that:
  - for a two-layer moving bed flow there is an additional pressure drop due to mechanical friction.
  - for fully suspended heterogeneous flow this additional pressure drop is less.

– the identification of the change over from laminar two-layer (moving bed) flow to laminar heterogeneous flow as a function of coarse solid particles concentration is important for safe and economic operation of pipelines.

It could be seen from this work that:

- The sand concentration does not change the flow pattern but increases pressure gradients.
- The concentration of carrier fluid can change the flow patterns from being layered to be homogeneous as it increases but pressure gradients increase as well.
- The ERT system is becoming a reliable tool in distinguishing flow patterns.

1.5 Significance

This thesis contributed to the following:

- Determination of flow patterns of settling slurries using pressure gradient vs. velocity plots and concentration profiles from the ERT instrument.
- An indication of areas for further development of this technique to enable better flow pattern detection.

A good understanding of complex slurry flow behaviour makes it possible to optimize energy and water usage, to improve quality and economy of transport of such slurries (Vlasak, Chara, Konfrst & Matousek, 2002).

1.6 Delineation

This project dealt with the determination of flow patterns of coarse particles (in the range of 1 to 3 mm) in non-Newtonian fluids or slurries in a horizontal circular pipe. In this work, only incompressible and time-independent fluids were considered and material with broad size distribution and particle size deterioration during tests were not investigated. Furthermore, only the moving bed and heterogeneous flow patterns were under consideration.

1.7 Methodology

The objectives were achieved by means of:

- a processing, analysis and evaluation of settling slurry flow data collected from tests using the Φ56 mm pipe test loop of Flow Process and Rheology Centre at the Cape Peninsula University of Technology. The instrumentation that was used comprised differential pressure transmitters, electromagnetic flow meters and the ERT instrument (for concentration profiling across pipe diameter).

- experimental tests that were performed for 6, 10 and 15% carrier fluid (kaolin) concentrations with sand particle sizes of 1 and 3 mm at 10, 20 and 30% concentrations.

Results obtained from the loop were presented as pressure gradients vs. superficial velocity plots for different concentrations and particle sizes, and as concentration profiles of these mixtures, at velocities ranging from 0.5 to 5 m/s. The effect of carrier concentration, particle concentration and particle size was derived and the change over velocity from laminar two-layer flow to laminar heterogeneous flow was determined from the ERT data and from the pressure gradient plots. A comparison of this transition velocity as obtained from the two techniques was done.

1.8 Organisation of dissertation

The remainder of the dissertation comprises 5 chapters. The literature review (Chapter 2) covers general classification of fluids and rheological characterisation of incompressible fluids, two-phase liquid-solid flow and techniques for determination of flow patterns. Relevant previous work is summarised and discussed. Chapter 3 describes briefly the pipe loop, the instrumentation, the material tested and the methodology used in testing. Chapter 4 presents experimental results while Chapter 5 discusses and compares results. Chapter 6 gives conclusions and makes recommendations for further research.

Chapter 2 Literature review and theory

The literature review covers basic concepts of fluid mechanics, rheology and flow of two-phase (solid-liquid) mixtures in horizontal straight pipes. Classification of these mixtures is reviewed and the techniques for the determination of flow patterns of coarse particles transported in non-Newtonian carrier fluid are discussed. The chapter gives also an overview of the current state of knowledge in the field of flow pattern detection. Therefore some of the concepts or equations might not be directly used in the present thesis.

2.1 Fluid behaviour

This section discusses fundamentals of single phase fluids and the general classification and rheological characterisation of such fluids. Its helps clarify the properties of the liquid phase used to transport sand in the present work.

2.1.1 Classification of fluids

Fluids can be classified in two ways - either according to their response to an externally applied pressure or according to the effects produced under the action of a shear stress. The first criterion of classification leads to the so called “compressible” and “incompressible” fluids, depending on whether or not the volume of an element depends on the pressure applied on it. While compressibility influences the flow characteristics of gases, liquids can normally be regarded as incompressible (Chhabra & Richardson, 2008). Incompressible fluids are classified into two broad categories - Newtonian and non-Newtonian.

2.1.2 Newtonian fluids

A Newtonian fluid is the one that has a constant viscosity, independent of shear rate or shear stress. It depends only upon the material, its temperature and pressure (Chhabra & Richardson, 2008). From elementary fluid mechanics, the shear stress in a two-dimensional laminar flow in the z - direction as shown in Figure 2.1 is:

$$\tau = \mu \frac{du}{dy} \qquad \textbf{(2.1)}$$

Equation (2.1) is called Newton’s law of viscosity. Fluids which do not obey Newton’s law are said to be non-Newtonian.

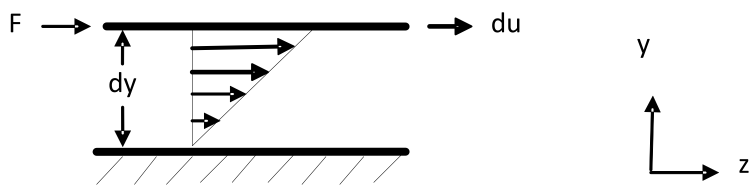


Figure 2.1: Velocity profile from wall for parallel flow (Adapted from Chhabra & Richardson, 2008)

2.1.3 Non-Newtonian fluids

A non-Newtonian fluid is one whose flow curve (shear stress vs. shear rate) is non-linear and/or does not pass through the origin. In this case, the apparent viscosity (shear stress divided by shear rate) is not constant at a given temperature and pressure, but is dependent on flow conditions such as flow geometry, shear rate, etc. and in some instances, even on the kinematic history of the fluid element under consideration (Chhabra & Richardson, 2008). Non-Newtonian fluids may be grouped into three broad categories:

Time-independent fluids

These are fluids for which the rate of shear at any point is determined only by the value of the shear at that point at that instant. These fluids are sometimes known as “purely viscous”, “inelastic” or viscoplastic (Chhabra & Richardson, 2008).

Time-independent fluids can be further divided into the following main types whose shear stress/strain rate behaviours are illustrated in Figure 2.2:

- Dilatant: The rheogram has an increasing slope with increasing shear rate and passes through the origin.
- Yield dilatant: The rheogram has an increasing slope with increasing shear rate but does not pass through the origin. The ordinate to the origin is called yield stress and corresponds to the minimum shear stress required to initiate flow.
- Bingham plastic: The rheogram is a straight line that does not pass through the origin. Once the yield stress is overcome, it behaves like a Newtonian fluid.
- Pseudoplastic: The rheogram has a decreasing slope with increasing shear rate and passes through the origin.
- Yield pseudoplastic: The rheogram has a decreasing slope with increasing shear rate but does not pass through the origin.

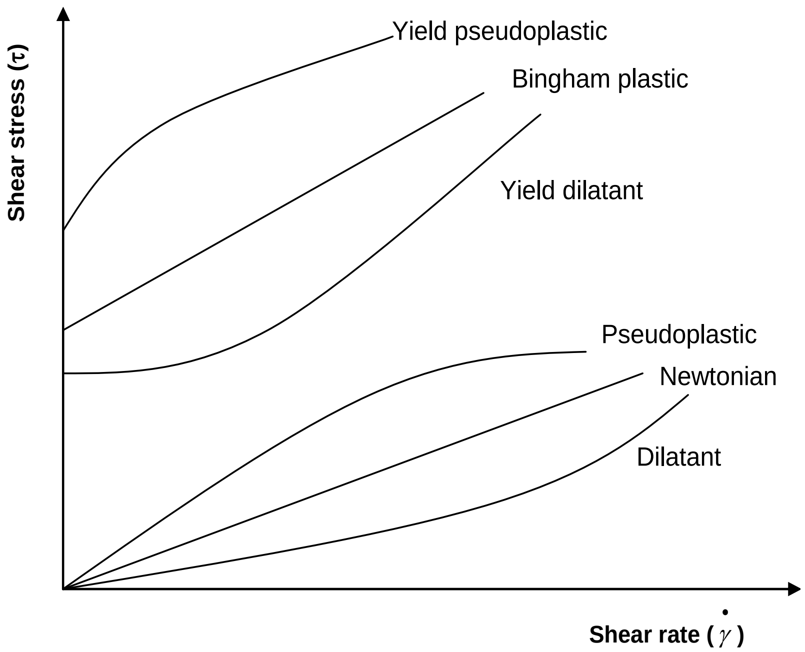


Figure 2.2: Rheograms of non-Newtonian fluids (Chhabra & Richardson, 2008)

Time-dependent fluids

These are more complex fluids for which the relation between shear stress and shear rate depends additionally upon the duration of shearing and the kinematic history (Chhabra & Richardson, 2008).

Visco-elastic fluids

These are fluids showing both time-dependent and time-independent characteristics together with partial elastic recovery after deformation (Chhabra & Richardson, 2008).

2.1.4 Flow of fluids in pipes

Energy loss manifests as a head loss (pressure drop) and the pressure gradient ($\Delta P / L$) is calculated using Darcy-Weisbach equation (Peker & Helvaci, 2008):

$$\frac{\Delta P}{L} = \frac{4 f \rho V^2}{2D} \tag{2.2}$$

In terms of hydraulic gradient ($\Delta h / L$), this equation may be rewritten as follows:

$$\frac{\Delta h}{L} = \frac{2 f V^2}{gD} \tag{2.3}$$

Equations (2.2) and (2.3) are equivalent and are used to determine the pressure drop (pressure gradient) or hydraulic gradient in pipe. The Fanning friction factor f is dependent on whether the flow is laminar or turbulent and can be determined from Equation (2.8) for the laminar flow or from the Colebrook-White equation (Equation (2.10)) for the turbulent flow or else from a Moody diagram for example.

Shear stress distribution

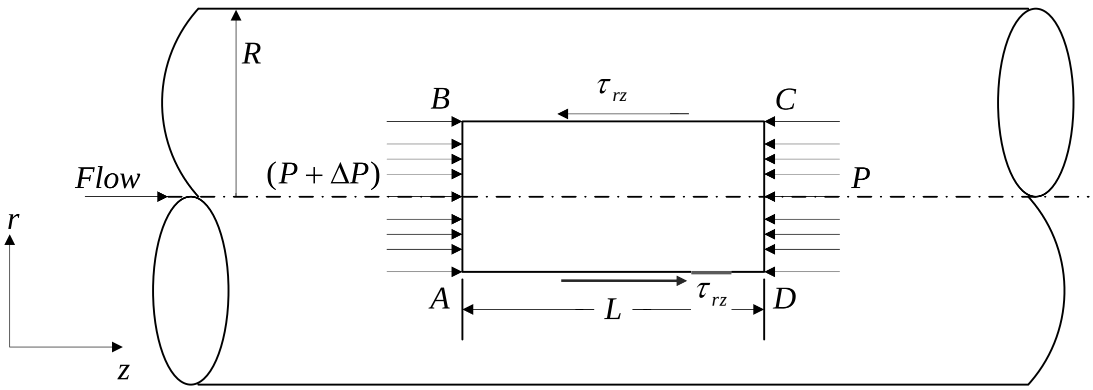


Figure 2.3: Shear stress distribution of fluid in pipe (Adapted from Chhabra & Richardson, 2008)

Figure 2.3 illustrates a fully developed and steady flow of a fluid through a constant diameter pipe. The flow is caused by the pressure difference imposed across the two ends of the pipe. The force balance in the direction of flow z on a fluid element $ABCD$ of radius r and length L is given by:

$$(P+\Delta P)(\pi r^2) - P(\pi r^2) = \tau_{rz}(2\pi rL) \tag{2.4}$$

so

$$\tau_{rz} = \left(\frac{\Delta P}{L}\right)\left(\frac{r}{2}\right) \tag{2.5}$$

Equation (2.5) shows that the linear variation of shear stress across the tube cross-section increases from zero at the axis of the tube ($r=0$) to a maximum value at the wall of the tube ($r=R$). It is valid for any incompressible fluid in a steady state (Newtonian or non-Newtonian) and for both the laminar and turbulent flow regimes. Therefore from Equation (2.5) the shear stress at the pipe wall is given by:

$$\tau_0 = \left(\frac{R}{2}\right)\left(\frac{\Delta P}{L}\right) \tag{2.6}$$

Viscous Friction Factor

By definition, the Fanning friction factor f is given by:

$$f = \frac{2\tau_0}{\rho V^2} \tag{2.7}$$

In general the friction factor is a function of Reynolds number and pipe wall roughness. However, in laminar flow the pipe roughness does not have influence on the friction factor and the Fanning friction factor is obtained from the relation:

$$f = \frac{16}{\mathrm{Re}} \tag{2.8}$$

Reynolds Number

By definition, the Reynolds number is a dimensionless number representing the ratio of inertial to viscous forces and for Newtonian fluids it is given by:

$$\mathrm{Re} = \frac{\rho VD}{\mu} \tag{2.9}$$

A high Reynolds number means that the flow is dominated by inertial forces and is turbulent, whereas a low Reynolds number indicates that the flow is dominated by viscous forces and is laminar. A Reynolds number between 2100 and 2400 marks the end of laminar flow.

As stated in Section 2.1.3, for non-Newtonian fluids the viscosity μ is not constant but depends on the shear rate or shear stress, so appropriate formulations for non-Newtonian Reynolds number must be used (Chhabra & Slatter, 2003). Many “general” or non-Newtonian Reynolds Numbers have been developed in the literature to determine the nature of the flow (for example Metzner & Reed, 1955; Slatter, 1994). The present study was not concerned with details of these non-Newtonian Reynolds numbers.

Laminar flow in pipe

In this flow regime, also referred to as streamline flow (Chhabra & Richardson, 2008), the paths traced by adjacent elements of a fluid do not interfere and are smooth and continuous. The fluid particles move in straight lines, but as a consequence of the viscosity there is a velocity gradient which is maximum at the centre of the pipe and decreases in some manner towards the wall of the pipe, where it is zero.

Turbulent flow in pipe

In turbulent flow, adjacent fluid elements deviate from their mean path, mixing in a disorderly manner and causing an exchange of momentum from one portion of fluid to another. The Fanning friction factor in the turbulent regime is a function of the Reynolds number and the pipe wall roughness k_r. It can be obtained for example from the Colebrook-White equation (Larock, Jeppson & Walters, 2000):

$$\frac{1}{\sqrt{f}} = -4\log\left[\frac{1.26}{\mathrm{Re}\sqrt{f}} + \frac{k_r}{3.7D}\right] \qquad \textbf{(2.10)}$$

Equation (2.10) is implicit in f and must be solved iteratively. The Moody diagram presents the friction factor f vs. Re and the relative roughness k_r / D of the pipe wall. This chart is a useful practical tool for the Fanning friction factor determination.

2.1.5 Rheology

Rheology is the study of the deformation and flow properties of matter (Malkin & Isayev, 2011). Specifically it is a relationship between the shear stress and shear rate. Matter can be solid, liquid, gaseous, liquid like, solid like or a mixture of two or more of these states.

2.1.6 Rheological models for time-independent non-Newtonian fluids

Although many rheological models have been developed and described in the literature, three models which have been used consistently to describe the viscous characteristics of slurries and sludges are shown in Table 2.1 (Chhabra & Richardson, 2008).

Table 2.1: Rheological models (Chhabra & Richardson, 2008)

Fluid model	Constitutive Equation	Parameters
Pseudoplastic (Power law)	$\tau = K\dot{\gamma}^{n}$	K and n
Bingham plastic	$\tau = \tau_y + K\dot{\gamma}$	τ_y and K
Yield pseudoplastic (Herschel-Bulkley)	$\tau = \tau_y + K\dot{\gamma}^{n}$	τ_y, K and n

2.1.7 Rheological characterisation

The choice of a suitable rheological model is of great importance for the characterisation of non-Newtonian fluids. In this work, the yield pseudoplastic model was used. This model incorporates the pseudoplastic and Bingham plastic models as special cases. Experimental tests are needed to determine the rheological parameters of a fluid. These tests are done in a tube viscometer or a rheometer (for rotary viscometry). The procedure used for tube viscometry is described in this section.

A tube viscometer consists of either a vertical or horizontal length of straight pipe of small diameter through which the test fluid is passed at varying rates (Alderman & Heywood, 2004). The flow rate and pressure drop over the length of the tube are measured and recorded. The measured parameters (pressure drop, tube length, tube diameter and velocity of the fluid) are then converted into wall shear stress (τ_0) given by Equation (2.6) and pseudo shear rate ($8V/D$) and are plotted on a pseudoshear diagram (τ_0 vs. $8V/D$).

For a given fluid in the laminar flow regime, experimental data points in the plot shear stress vs. shear rate for different pipe diameters coincide (Chhabra & Slatter, 2003) and the rheological parameters (τ_y, K and n) can be determined from the following procedure (if there is no slip, entrance effect, etc.):

For a series of N data points in the laminar region, assume values of τ_y, K and n as initial guess. Then, a root mean square error of fit function E is defined as follows (Slatter, 1994):

$$E = \sqrt{\frac{\sum_{i=1}^{N}\left[\left(\frac{8V}{D}\right)_{iexp} - \left(\frac{8V}{D}\right)_{icalc}\right]^2}{N-1}} \quad \textbf{(2.11)}$$

The calculated shear rate $\left(\frac{8V}{D}\right)_{icalc}$ is obtained from Equation (2.12), which is derived from the plug flow of yield pseudoplastic fluids (Chhabra & Richardson, 2008):

$$\frac{32Q}{\pi D^3} = \frac{8V}{D} = \frac{4n}{K^{\frac{1}{n}}\tau_0^3}\left(\tau_0 - \tau_y\right)^{\frac{n+1}{n}}\left[\frac{\left(\tau_0 - \tau_y\right)^2}{3n+1} + \frac{2\tau_y\left(\tau_0 - \tau_y\right)}{2n+1} + \frac{\tau_y^2}{n+1}\right] \quad \textbf{(2.12)}$$

For a given set of values of τ_y, K and n, error E was minimised by changing this set of values with a constraint $n \le 1$.

Rabinowitsch-Mooney relation

The Rabinowitsch-Mooney relation is a correction of pseudoshear rate in order to determine the true pipe wall shear rate. It is given by (Chhabra & Richardson, 2008):

$$\left[-\frac{du}{dr}\right]_0 = \frac{8V}{D}\left[\frac{3n' \; +1}{4n'}\right] \quad \textbf{(2.13)}$$

where n' is given by:

$$n' \; = \frac{d(\ln \tau_0)}{d\left(\ln \frac{8V}{D}\right)} \quad \textbf{(2.14)}$$

The shear rate ($8V/D$) determined from experimental measurements is called the apparent shear rate and is multiplied by the correction factor $(3n' \; +1)/4n'$ to obtain the true wall shear rate.

2.2 Two phase liquid-solid flow in pipe

This section discusses fundamentals of slurries whose slip velocity, or mean velocity of the liquid phase minus mean velocity of the solid phase, is considerable.

2.2.1 Classification and characterisation of slurries

An enormous range of mixtures described as slurries is encountered in a wide range of industrial sectors including civil engineering, mineral processing and the food industry. Several classifications are possible, depending on the application field. The three presented here are based on physical properties, rheology or flow behaviour (Brown, 1991).

Classification based on physical properties

Attributes that are commonly used to characterise slurries are the basic physical properties of the constituents, in particular those of the solids. They are:

- Concentration of solids: The behaviour of slurries changes significantly as the solids concentration increases. Therefore, slurries are classified as low to high concentration slurries.

- Characteristic particle size (and particle size distribution) and shape: Slurries are classified as being made up of rounded or angular particles; fine, medium and coarse particles or mixed regime slurries for a wide range of particle sizes.

Classification by settling behaviour

Slurries can also be characterised as non-settling, slow-settling or settling, depending on the particle settling rate, as follows:

- Non-settling slurries: The settling velocity of particles is small. Particles are suspended by Brownian motion and the mixture is homogenous even in laminar flow. These slurries normally exhibit non-Newtonian behaviour. The solids are uniformly distributed across the pipe section and there is no vertical concentration gradient. The solid and liquid phases do not separate until a long period in a quiescent state has passed (Cooke & Paterson, 2004). Nevertheless, the quantification of these subjective descriptions has to be made with regard to the time frame over which settling is supposed to be important. The majority of particles contained in most industrially important slurries will settle appreciably, given sufficient time, in the absence of supporting forces originating within the flow structure (Brown, 1991).

- Slow-settling slurries: The particles are not significantly maintained in suspension by Brownian movement and settle out in laminar flow. In a quiescent state the solid particles settle slowly en masse (Brown, 1991).

- Settling slurries: The solid and liquid phases are separate and the liquid properties are generally considered to be unaltered by the presence of the solids. Particles are supported by turbulent mixing or interparticle collisions. Settling mixtures are characterised mainly by a concentration gradient increasing towards the bottom of a horizontal pipe (Goosen, 2004).

- Mixed regime slurries: These contain a wide range of particle sizes and/or densities. The fine particles mix with the liquid to form the vehicle, the coarser particles are transported in the vehicle and depending on the flow conditions are supported by the vehicle yield stress, turbulent mixing and/or interparticle collisions.

Characterisation by flow behaviour

With regard to the flow behaviour, slurries are classified as homogeneous suspensions, heterogeneous suspensions, flow with saltation and fully stratified flow regimes which can be sliding or stationary bed. The mechanism of these flow regimes is described in Section 2.2.2.

2.2.2 Flow regimes for settling slurries

The flow regimes exhibited by settling slurries are closely related to the distribution of solids in the cross-section of the pipe. Figure 2.4 shows schematically the boundaries between the flow regimes for settling slurries in horizontal pipes.

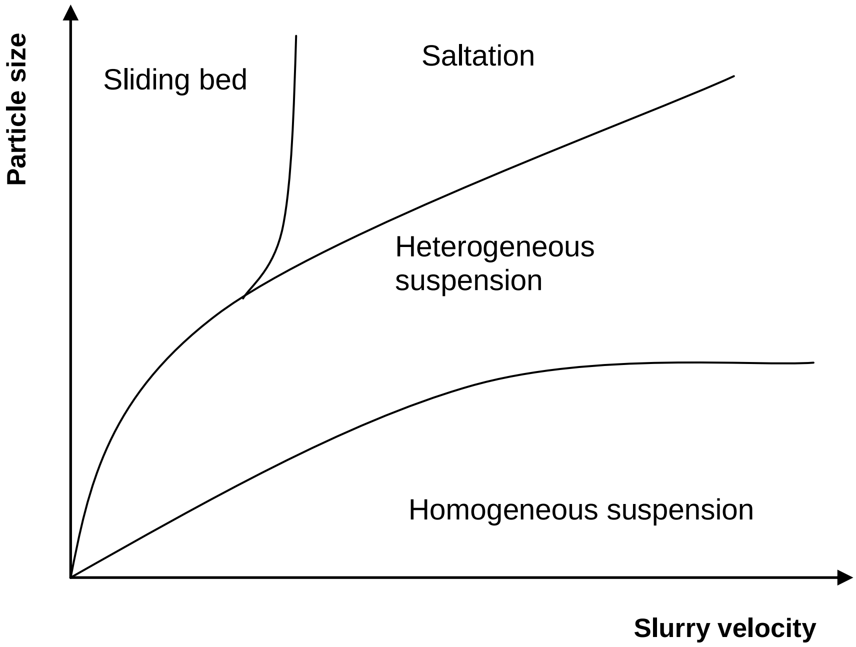


Figure 2.4: Four regimes for transport of solids through pipe (King, 2002)

The tendency that the solid particles have to settle under the influence of gravity and shear has a significant effect on the behaviour of slurry as it is transported in a horizontal pipeline. The settling tendency leads to a significant gradation in the concentration of solids in the slurry. The concentration of solids is higher in the lower sections of the horizontal pipe. The extent of the accumulation of solids in the lower section depends strongly on the velocity of the slurry in the pipeline. The higher the velocity the higher the turbulence level and the greater the ability of the carrier fluid to keep the solid particles in suspension (King, 2002).

At very high turbulence levels the suspension is almost homogeneous with very good dispersion of the solids. At low turbulence levels the particles settle towards the pipe's invert and can remain in contact with the floor, being transported as a sliding bed by the pressure gradient.

Between these two extremes of behaviour, two other more-or-less clearly defined flow regimes can be identified. When the turbulence level is not high enough to maintain a homogenous mixture but is still sufficiently high to prevent any deposition of particles on the floor of the channel, the mixture is described as a heterogeneous mixture. As the velocity of the slurry is reduced further a distinct mode of transport known as saltation develops. In the saltation regime the solids spend some of their time on the floor and the rest in suspension in the flowing fluid. Under saltation conditions the concentration of solids is strongly non-uniform. The flow regime depends strongly on the size and density of the particles that make up the slurry. In practice, the boundaries between these flow regimes are not sharp (King, 2002).

Some authors classify the four flow regimes of settling slurries into pseudo homogeneous, heterogeneous, moving-bed flow (particles settle out of the flow, form a bed and move in the flow direction by sliding, rolling or saltation) and stationary-bed flows (particles settle out of the bed and they do not move in the bed) (Liu, 2003). Others have classified the flow regimes of settling slurries into three groups: pseudo homogeneous or fully-suspended, heterogeneous or partially-suspended and fully-segregated or fully-stratified flow regimes (Sundqvist, Sellgren & Addie, 1996).

2.3 Determination of flow patterns for coarse particles

In the flow of solid-liquid mixtures through a pipe, the solid particles at any concentration may form a homogeneous or heterogeneous flow or layered flow such as two-layer or three-layer flow depending on the flow rate, causing a particle concentration distribution along the vertical direction across the cross-section of the pipe. Therefore, plots of these parameters as pressure losses vs. mean suspension velocity and particle concentration distribution along the vertical distance above the pipe wall can be used as tools to show the flow patterns (Peker & Helvaci, 2008). The knowledge of flow patterns is an invaluable input or key to the simulation of two phase liquid-solid flow using theoretical models. The present work deals with experimental determination of flow patterns.

The classification used in Peker & Helvaci (2008) distinguishes three flow patterns, namely fully suspended suspension flow (homogeneous or heterogeneous flow), two-layer suspension flow (with moving bed) and three layer suspension flow (with stationary bed). Figure 2.5 shows the general relation between the pressure loss and suspension velocity as a function of solid volume fraction. In the case of pure liquids, which do not contain any particles, the pressure loss changes linearly with velocity. At high velocities where the particles tend towards a homogeneous distribution, the pressure drop of suspensions approaches that of the pure liquid.

As the suspension velocity decreases, the relation between the pressure loss and velocity becomes nonlinear. The velocity at this transition point is called suspending or homogeneous velocity, V_{susp}. From this point upwards, the pressure gradient profile is parallel to that of carrier fluid alone. A further decrease in velocity causes a decrease in pressure loss which shows a minimum at point, called limit deposit velocity, V_{dep}. The velocities below this limit cause formation of the moving bed, which results in an increase in pressure loss due to the increase in hydrostatic pressure and particle-particle, particle-wall, and particle-liquid interactions. The velocity at which the pressure loss increases and the velocity below which there is no flow is called minimum deposition velocity, $V_{m,dep}$. A stationary bed forms since the velocity is not sufficient to cause particle motion (Peker & Helvaci, 2008).

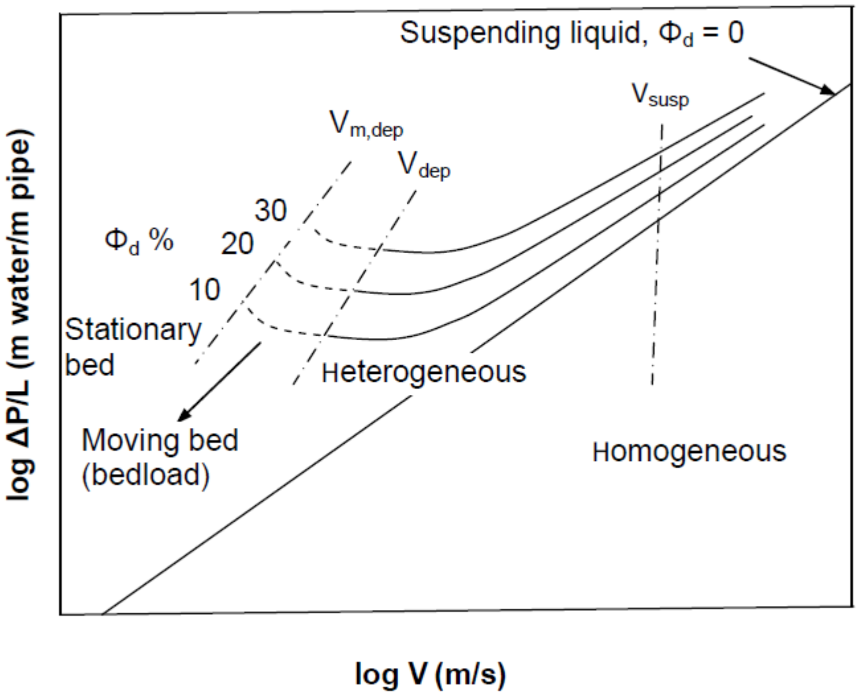


Figure 2.5: Two-phase solid-liquid flow patterns and transition velocities (Peker & Helvaci, 2008)

Transition velocities between different flow regimes are not clearly evident in Figure 2.5 and therefore become subjective.

Settling slurries exhibit different flow patterns based on visual observations of the dispersed phase flow as shown in Figure 2.6. A general classification of the flow patterns based on solid distribution in the cross-sectional area of the pipe is fully suspended flow with two subdivisions-pseudohomogeneous and heterogeneous flow, flow with moving bed, and flow with stationary bed (Peker & Helvaci, 2008).

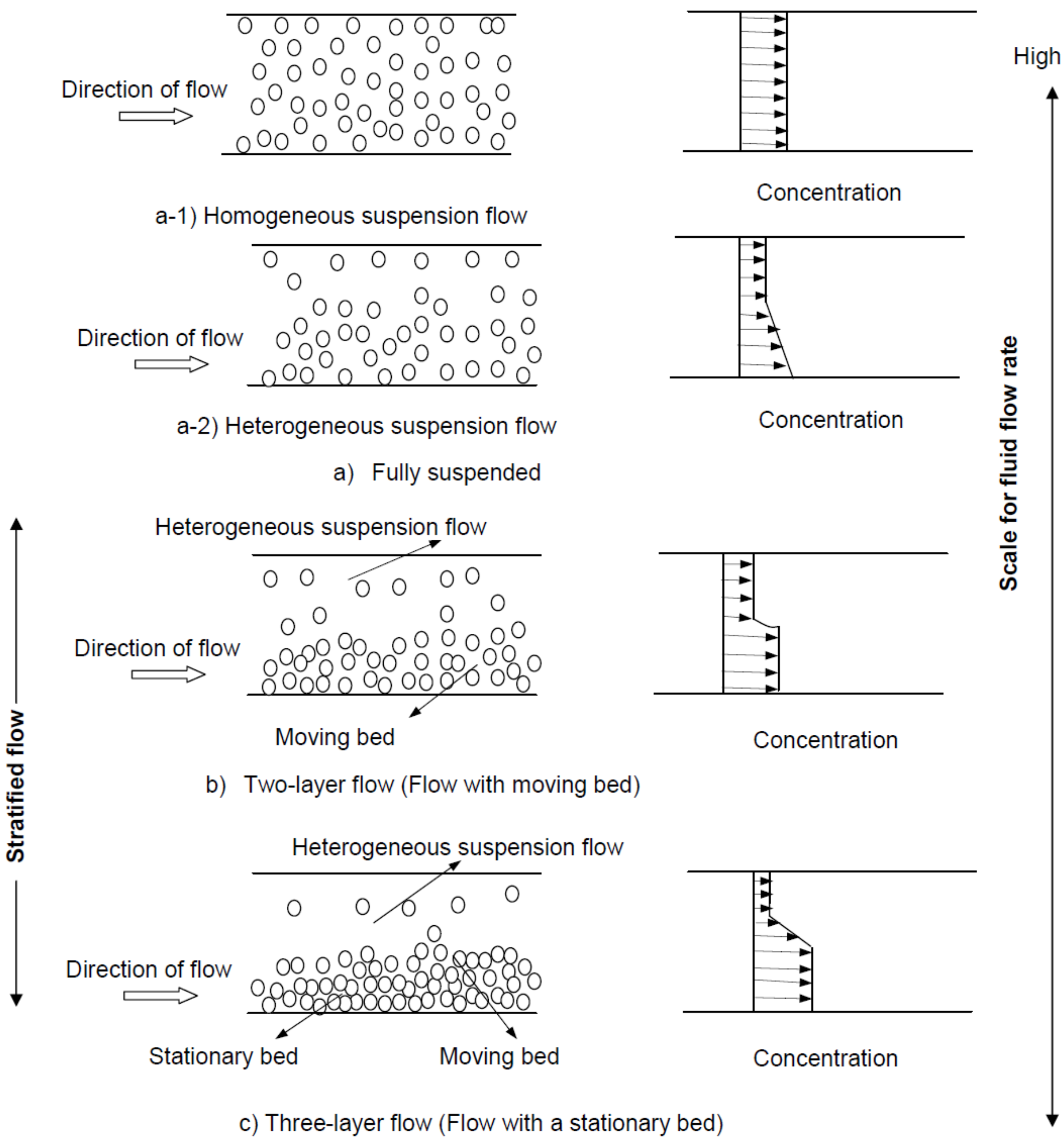


Figure 2.6: Visual observations of flow patterns in the direction of the flow and concentration profiles in the pipe cross section (Peker & Helvaci, 2008)

2.4 Previous work done in flow pattern determination

This section briefly summarises some of the approaches taken by different researchers to identify flow patterns. It does not deal with formulations of theoretical models for flow pattern prediction. However, where applicable, theoretical formulations of transition velocities from one flow regime to another are reviewed.

2.4.1 Work done to predict transition velocities

In 1972 Wilson derived the six basic governing equations of the two-layer model. Since the deposition of solids should be avoided at all cost, the expected two-layer model output in the early versions of this model was the maximum velocity at the limit of deposition (Wilson, Addie, Sellgren & Clift, 1997). This velocity was obtained by setting (in the governing equations) the velocity of the bed to be zero at incipient motion.

The value of this deposition velocity depended on internal pipe diameter, particle diameter and relative density. The effect of these variables was expressed by a nomographic diagram (Wilson, 1976). This nomogram is shown in Figure 2.7 and was recommended as a practical design aid. Wilson's experiments were based on sand-water mixtures.

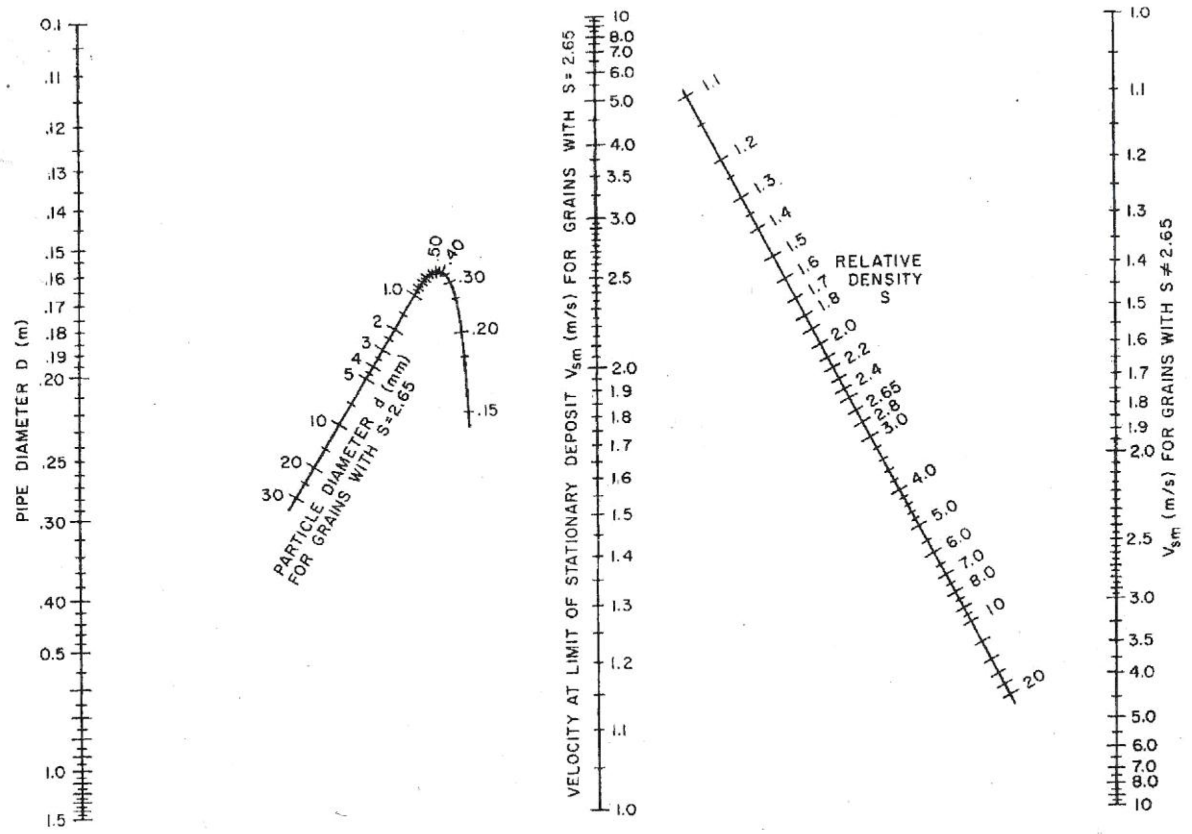


Figure 2.7: Nomogram for maximum velocity at limit of stationary deposition (Wilson *et al*., 1997)

Skudamov, Gibbons, Erian & Rinker (2002) presented a comparative work focusing on glass beads-water slurries having the same median particle size but three different particle size distributions. Experimental measurements were compared with predictions of the Wasp model for friction losses and Oroskar-Turian and Durand correlations for critical velocity. For critical velocity measurements, a video camera was placed under the transparent section of the flow loop pipeline and focused on the bottom of the pipe.

The theoretical minimum velocity V_c demarcating flows in which the solids form a bed at the bottom of the pipe from fully suspended flows was obtained from the following empirical correlation of Oroskar and Turian (Skudamov *et al*., 2002):

$$\frac{V_c}{\sqrt{gd(S-1)}} = 1.85 C_v^{0.1536} (1 - C_v)^{0.3564} \left(\frac{D}{d}\right)^{-0.378} \mathrm{Re}_p^{\;0.09}\, x^{0.3} \quad \textbf{(2.15)}$$

In Equation (2.15), for a range of critical velocities of 0.02 to 1.62 m/s a rough value of $x = 0.96$ was used and the overall root mean square deviation of critical velocity from experimental values was found to be 21.8%. Furthermore, this equation was developed for single sized solids and a weighted average method was used with it to calculate moving bed velocity for slurries with different particle size distributions. It was obtained after regression analysis on experimental points of Newtonian slurries (solid-water slurries) in the study of Skudamov *et al*. (2002).

The Durand correlation for critical velocity was expressed as follows (Skudamov *et al*., 2002):

$$V_c = F_L \left[2gD \left(\frac{\rho_s - \rho_l}{\rho_l} \right) \right]^{0.5} \quad \textbf{(2.16)}$$

The dimensionless factor F_L depends on particle size and concentration and was determined from the plot shown in Figure 2.8.

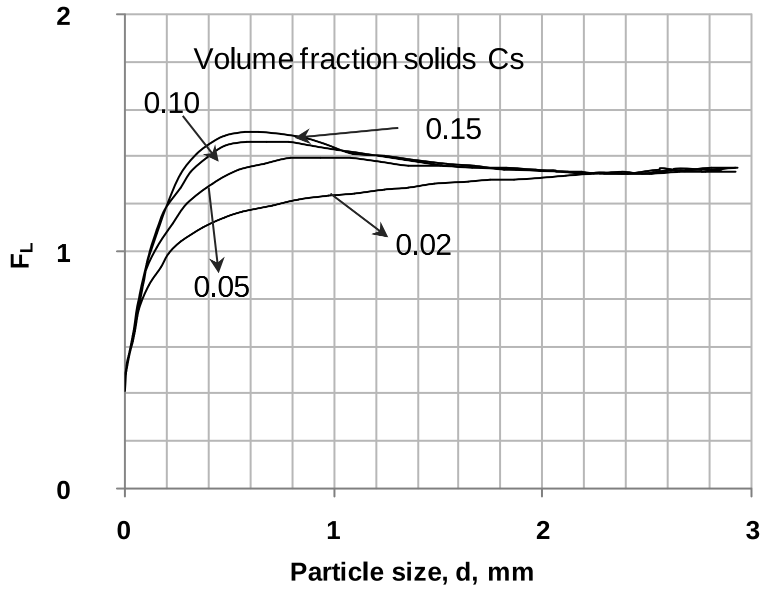


Figure 2.8: Dimensionless factor F_L for Durand's correlation (Skudamov *et al.*, 2002)

Experiments were conducted with single species slurries (glass beads-water mixtures) having same median particle size of 250 µm but different particle size distribution ranging from narrow to wide in a 22 mm internal pipe diameter and horizontal pipe loop. Critical deposition velocity was measured from visual observations.

Comparison of moving bed velocities predicted by the Oroskar-Turian correlation, Durand correlation and those experimentally measured by Skudamov *et al*. (2002) showed that the Oroskar-Turian correlation failed to predict the maximum in the moving bed vs. concentration curves. For narrow and medium distributions, predictions of the Oroskar–Turian correlation were closer to the experimental values (average errors of 17% and 23% respectively) than for the broadest distribution for which the correlation under-predicted the experimental data by an average of 28%. Durand correlation gave best prediction (average error equal to 10%) for the slurry with broad distribution and over-predicted the critical velocity for narrow and medium distributions. The two correlations for critical velocity failed to predict the decrease in this velocity for slurry concentrations above 17% (Skudamov *et al*., 2002).

One of the weaknesses of the approach taken by Skudamov *et al*. (2002) was the visual observation method used in the measurement of critical velocity. This velocity can in fact become subjective.

Patchowko (2004) carried out a literature review concerning the flow patterns possible in horizontal pipes along with critical velocity, concentration profiles and pressure drop or pressure gradient modelling. Among other things, it was emphasised that some researchers in the field used the minimum in the pressure-loss transport velocity graph as a means of determining the "critical velocity", also called "critical deposition velocity", "deposition velocity" or "minimum velocity". It is the transitional velocity at which the asymmetric flow pattern of the mixture starts to develop. At this velocity, the solid particles begin to form a deposit at the bottom of the pipe. In the literature, the critical velocity is often confused with the transitional velocity between moving bed and stationary bed. This is due to the difference between the two velocities being small. The critical velocity can be seen as the lowest possible velocity that can be used in order to minimise pipe wall erosion while the limit of stationary deposition is the lowest transport velocity that can be physically used. In real life the transitional velocity between moving and stationary beds is difficult to spot in this flow regime since the flow is unstable (Patchowko, 2004).

Patchowko (2004) conducted experiments in a Φ50 mm pipe flow loop using three different sands in water. Sand 1 had a narrow particle size distribution, with few particles below 75 µm in size and no coarse fractions. Sand 2 had also a narrow distribution (broader than 1) but having more particles in the fine and coarse fractions. Sand 3 was characterised by a very broad particle size distribution and the largest median particle size of all three sands. Mixtures were tested over a velocity range of 0.8 to 5 m/s and sand concentrations from 5 to 35% by volume. The following equation for critical velocity was derived for median particle size between 0.23 and 5.34 mm, particle densities of 1040 and 2680 kg/m^3, pipe diameters of 19 to 700 mm, delivered concentration of 0.75 to 34.3% by volume, particle settling velocities of 29 to 350 mm/s, and covering critical velocities of 0.29 to 4.3 m/s (Patchowko, 2004):

$$\frac{V_c}{\sqrt{2gD(S-1)}} = 3.63\left(\frac{\rho_l U_l^{*} d_{50}}{\mu_l}\right)^{0.114}\left(\frac{d_{50}}{D}\right)^{0.308}\left(\frac{V_t}{U_l^{*}}\right)^{-0.063}(S-1)^{-0.510}C_v^{\ 0.010} * (1-C_v)^{-0.050}\left(\frac{U_l^{*2}}{gd_{50}}\right)^{0.472} \quad \textbf{(2.17)}$$

It can be noted that this equation is valid for Newtonian carrier fluids only.

2.4.2 Work done in experimental recognition of flow patterns

As stated in Section 1.1, Kolar & Keska (2002) analysed and compared a set of four techniques of flow pattern determination. The study was based on direct experimental measurements using pressure, resistive, capacitive and optical sensors in the same space and time. The parameter that was used in their study of flow patterns was the RMS value of the voltage of the signal obtained from the four systems. The RMS value was obtained from the following expression:

$$RMS_i = \sqrt{\frac{\sum(\bar{V} - V_i)^2}{numberofsamples}} \quad \textbf{(2.18)}$$

The RMS values vs. the average concentration for each flow condition and for all four measurement systems used were plotted and a comparative sensitivity analysis of the four techniques was carried out based on the trend of the curve. Using this statistical tool (RMS) they concluded among other things that only pressure and resistance signals produced similar results in the range of flow patterns. No criterion for flow pattern determination and no transition velocity between flow regimes was defined.

Experimental work was carried out by Giguère *et al*. (2008) in a Φ76 mm pipe. Two pipe sensors, each including 16 electrodes were mounted on each side of the vertical downward bend section of the loop. The adjacent electrode pair strategy was used for the resistance measurements. As stated in Section 1.1 the slurry consisted of a mixture of tap water and non-conductive glass beads of 100 µm in diameter and with a density of 2500 kg/m^3. Mixtures of water and beads at 5, 10, 15 and 20% volumetric concentrations were tested in the range of average velocities from 0.22 to 2.2 m/s. Analysis of concentration tomograms led to the conclusion that for the four slurry concentrations tested, the bed appears at a velocity between 0.9 and 1.1 m/s. Giguère *et al*. (2008) developed a strategy in which statistical parameters were used in the direct interpretation of ERT measurements for flow patterns detection. Their approach is shown below.

The normalised slurry conductivity η_s, the apparent solids concentration ϕ, the conductivity σ_w of the conductive phase and the slurry conductivity σ_{so} at the initial condition (ie: the initial reference homogeneous conductivity) were related by Equation (2.19).

$$\phi = \frac{2 - 2((1+\eta_s)/(\sigma_w/\sigma_{so}))}{2 + ((1+\eta_s)/(\sigma_w/\sigma_{so}))} \quad \textbf{(2.19)}$$

For each dataset of N resistance measurements, Equation (2.19) yields a vector of apparent solids concentration ϕ represented by

$$\phi = [\phi_1, \phi_2, ..., \phi_N] \quad \textbf{(2.20)}$$

If a homogeneous distribution is assumed the average ϕ_M of the vector ϕ components provides an estimation of the apparent concentration of slurry and is given by

$$\phi_M = \frac{1}{N}\sum_{i=1}^{N}\phi_i \qquad \textbf{(2.21)}$$

The standard deviation ϕ_S of the apparent concentration was then computed as follows:

$$\phi_S = \frac{1}{N}\sum_{i=1}^{N}(\phi_i - \phi_M)^2 \qquad \textbf{(2.22)}$$

A large value of ϕ_S indicates a heterogeneous distribution while a value equal to zero is an indication of a homogeneous distribution. In addition to the standard deviation of the apparent concentration, symmetry of the concentration distribution was defined and used to assess homogeneous distribution. Symmetry is a necessary but not sufficient condition for a homogeneous distribution (Giguère *et al*., 2008).

From the direct interpretation of ERT measurements it was possible to compare the influence of bulk solids concentration on the transition between homogeneous and heterogeneous slurry flow regimes. It was concluded that between 5 and 10%, the solids concentration seemed to influence the velocity transition from homogeneous to heterogeneous regime, but only little difference was observed when slurry concentration was higher than 10%. Below the critical velocity of 1.1 m/s, where the particle beds have been detected using image reconstruction, the homogeneity and symmetry indicators both started to increase sharply. Therefore when decreasing slurry velocity, a sudden change in the slope of the standard deviation of conductivity ϕ_S vs. slurry velocity and that of the symmetry index appeared to be a useful indicator to detect the presence of a solid particle bed without the need for an image reconstruction technique (Giguère *et al*., 2008).

Pachowko, Wang, Poole & Rhodes (2003) conducted a comparative study of three methods used in recognising flow patterns in horizontal slurry transport pipelines. Experimental tests were run in the range of delivered concentrations of 6 to 15% by volume of sand (d_{85} = 500 µm) in water and velocities were between 0.3 and 4.8 m/s. The first method used in flow pattern detection involved a visual inspection through a transparent piece of pipe to see when a moving or stationary bed starts to form at the bottom of the pipe. This method could not be used to distinguish between heterogeneous and pseudohomogeneous flow patterns. The second was the examination of the tomograph image produced at a fixed solids concentration value. From the images it was possible to see when the solids concentration is uniformly distributed, when a moving bed starts to form at the pipe's invert or when the bed becomes stationary. This method again relies on the operator's judgement or experience, as it is difficult to differentiate between pseudohomogeneous and heterogeneous flow and to determine when a stationary bed starts to form. However, Pachowko *et al*. (2003) noticed that once the bed of particles occupy more than one eighth of the image, then the bed was likely to be stationary. This technique was used for the distinction between heterogeneous and moving bed type flows, the problem being that it can only give a range of values of a transition velocity and not an exact value.

To assess the effect of slurry composition, particle size distribution and volumetric concentration on flow parameters, Vlasak *et al*. (2002) conducted an experimental study on mixtures of fine, medium and coarse sand transported in water and in low or medium concentrated kaolin. Quartz sand with d_{50} = 200, 700 and 1400 µm was used respectively as fine, medium and coarse sand. Some of the reported results from tests in a pipe of diameter 26.8 mm are displayed in Figure 2.9 and Figure 2.10.

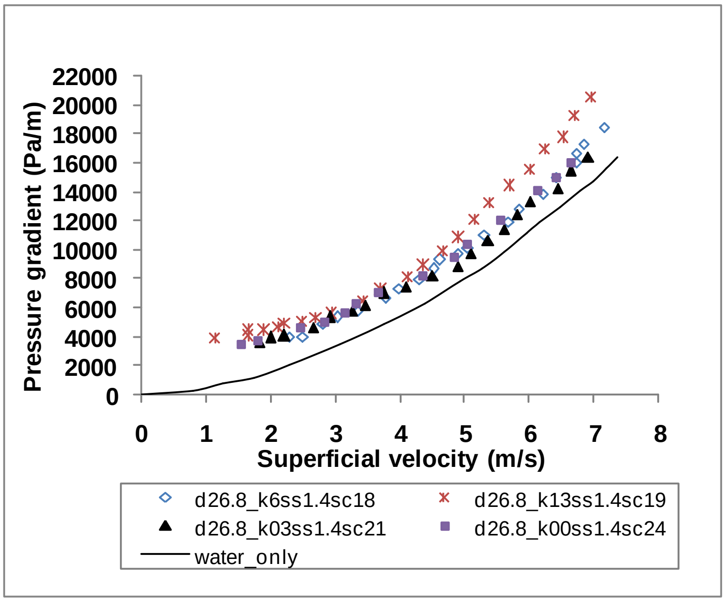


Figure 2.9: Resistance curves for 1.4 mm sand in water and in kaolin (Vlasak *et al*., 2002)

Figure 2.9 shows that for 19% of 1.4 mm sand transported in 13% kaolin carrier, the pressure gradient is slightly higher than the rest of mixtures (18, 21 and 24% of the same sand size in respectively 6% kaolin, 3% kaolin and water) in the laminar regime. For higher velocity range the pressure gradient increases much more compared to the other mixtures, in particular the mixture of sand and water only. This indicates that the viscous properties of the carrier fluid dominate the flow in turbulent regime and that the effect of kaolin carrier is more beneficial in laminar regime and at lower kaolin concentration (3%).

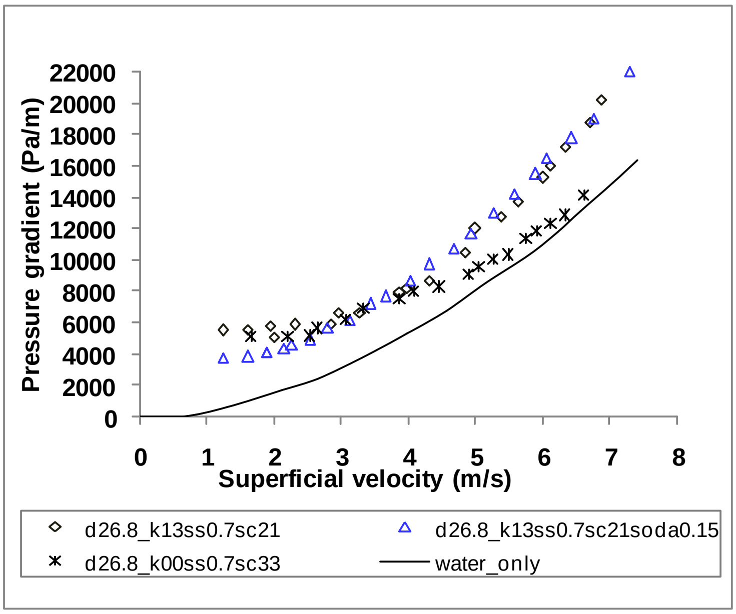


Figure 2.10: Resistance curves for 0.7 mm sand in water, kaolin and in peptised kaolin carrier (Vlasak *et al*., 2002)

Figure 2.10 indicates that when the kaolin carrier fluid is peptised (by addition of soda to prevent interparticle attractive forces) the pressure gradient in the laminar regime decreases significantly. However, for velocities ≥ 3 m/s the peptised sand-kaolin slurry reaches higher values of the pressure gradient than those obtained for kaolin carrier without chemical agent.

As in the case of coarse particles (Figure 2.9), at low velocity range the effect of kaolin concentration seems to be negligible. If the velocity increases, the pressure gradient increases as the carrier concentration increases. Nevertheless, at very low kaolin concentration the pressure gradient of sand-kaolin slurry is less than that of a sand slurry without kaolin of the same total slurry concentration (Vlasak *et al*., 2002).

The flat trend or hooklike inclination of the resistance curves in the laminar regime in Figure 2.9 and Figure 2.10 is an indication of a layered flow regime. In addition to pressure gradients vs. velocity curves, Vlasak *et al*. (2002) presented profiles of excess pressure gradients ratio vs. velocity for fine, medium and coarse sand transported in water. These results are displayed in Figure 2.11 from which it was observed that for average velocities ≤ 4 m/s the excess pressure gradient ratio of the medium sand reaches values higher than those of the fine sand or both sand mixtures and is similar to the coarse sand. For velocities between 4 and 7 m/s the medium sand pressure gradient ratio is surprisingly less even than that of a fine sand (Vlasak *et al*., 2002).

The steepness of the excess pressure gradients ratio profiles can indicate the type of dominating flow regime, a steep trend being an indication of a layered flow. However, Vlasak *et al*. (2002) do not provide any means for flow patterns detection. More recent work showed the same trends (Vlasak & Chara, 2009; Vlasak & Chara, 2011).

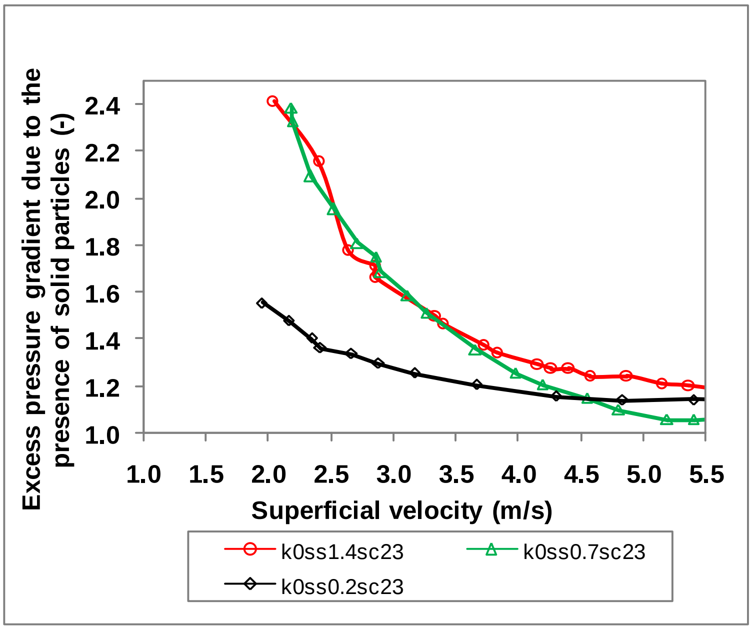


Figure 2.11: Excess pressure gradients profiles of sand transported in water in Φ26.8 mm pipe (Vlasak *et al*., 2002)

2.5 Conclusion

This chapter presented useful basic concepts of fluid mechanics and rheology. Rheological characterisation of carrier fluids and classification of two phase liquid-solid flows were discussed before introducing the techniques for determining the flow behaviour in both flow map and concentration profiles. Available predictive approaches for the critical velocity (velocity at the boundary between bed flow and heterogeneous flow regimes) were presented. In early years this transition velocity was confused with the velocity at the limit of deposition since this was the main concern in those days and had to be avoided at all costs to avoid pipe blockage and wear. These predictive tools were developed at the time when only Newtonian carrier fluids were used to transport solids. Previous work done in flow patterns prediction and experimental detection of these has been presented. It appeared that experimental techniques for flow pattern detection need to be expanded to the case of coarse solid particles in non-Newtonian carrier fluids.

Research aspects identified

After completion of the literature review, it is evident that there is a need for reliable tools for determination of flow patterns and transition velocities for solid-liquid two-phase flow or non-Newtonian settling slurries. The present work focuses on experimental approaches in flow patterns detection.

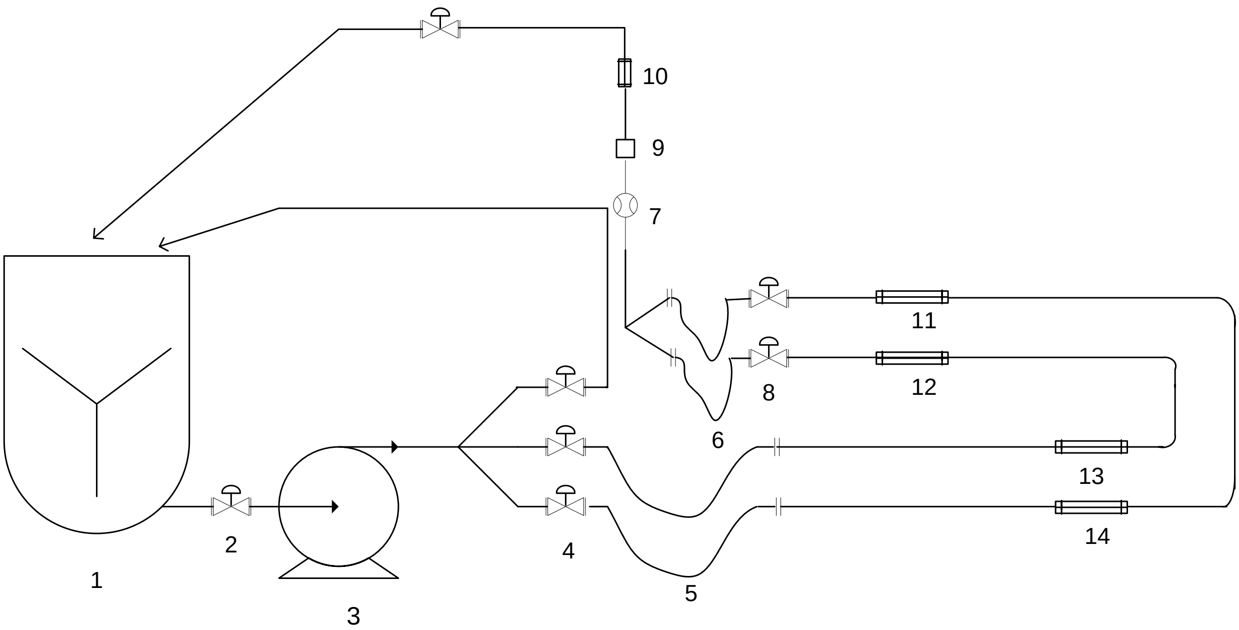
Chapter 3 Research methodology

3.1 Introduction

This chapter describes the experimental test loop, the instruments used in the test work and the materials tested. The calibration results of the instrumentation are presented and the experimental procedures are explained.

3.2 Description of the test loop

The pipe rig used for testing was an open flow loop and consisted of Φ56 and Φ80 mm pipes mounted in parallel and which could be operated alternatively by means of discharge valves. The outlets of both lines were connected to a vertical Φ80 mm pipe in which the flow meter was installed. A schematic diagram of this re-circulating flow loop system is presented in Figure 3.1. Photographs of the loop are given in Appendix A.



1 Mixing tank
2 Suction valve
3 Circulation pump
4 Discharge valves
5 & 6 Hose pipes
7 Flow meter
8 Valves
9 Density gauge
10, 11 & 14 ERT electrode rings for Φ 80 mm pipe
12 & 13 ERT electrode rings for Φ 56 mm pipe

Figure 3.1: Schematic diagram for the test loop

The two test pipes on both outlet and return legs of the two lines of the loop were uPVC class 12. The outgoing and return legs of the smaller Φ56 mm pipe had the same length of 10.6 m which amounts to 190 times the pipe diameter and two test sections were used in each leg. The two test sections in the outlet leg were respectively 2.536 m (or 45 times the pipe diameter) and

3.641 m (or 65 times the pipe diameter) long and the remaining two others in the return leg had the same lengths as in the outlet leg. Similarly, the larger Φ80 mm pipe had a total length of 11 m (or 190 times the pipe diameter) in each leg and the two tapping distances in the outlet leg were respectively 2.502 m (or 31 times the pipe diameter) and 3.637 m (or 45 times the pipe diameter) with the same lengths being duplicated in the return leg.

The lead in distance to the first pressure tapping or the disturbance free approach length that preceded the test section was 5.2 m. This distance was equivalent to 93 times the diameter of the smaller pipe and 65 times the diameter of the larger pipe.

The mixing tank that was used had a capacity of 1500 Litres. To ensure homogeneity of the material pumped into the pipes, this tank was fitted with a Turbulator mixer (with 2 impellers as shown in Figure 3.2. The mixer was driven by an 18.5 kW electrical motor via a 3:1 belt reduction and a WEG CFW 09 Variable Speed Frequency Drive (VSD).

(a) (b)

Figure 3.2: Turbulator mixer (a) 18.5 kW motor and belt drive (b) mixer impelers

Two pumps namely a Warman 4/3 and a Warman 3/2 AH were alternatively used and the speed of rotation of each was controlled via a variable frequency drive. The Warman 4/3 was used for 15% kaolin carrier tests while the Warman 3/2 AH was used for 6% and 10% kaolin carrier tests. An electrical motor WEG (55 kW) was used with Warman 4/3 pump whereas WEG (18.5 kW) was used with Warman 3/2 AH pump. A gate valve was installed between the tank outlet and pump inlet. As seen in Appendix A (Figure A.2), the pump outlet connects via a stainless steel Y-piece to a diaphragm valve in each line and through a T-piece to a diaphragm valve in a bypass line. These valves were connected to the test pipe inlets by a Φ80 mm rubber hose in each line. The return legs connect also via Φ80 mm rubber hoses to a stainless steel Y- piece and bend into the Φ80 mm uPVC vertical return pipe (Figure 3.1). This vertical return pipe was equipped with a radioactive density gauge which was providing a reading of the density of the material being pumped and was used in conjunction with an ERT ring to check it.

Each test section had a short glass viewing window or piece of glass fitted inside a PVC holder as shown in Figure 3.3.

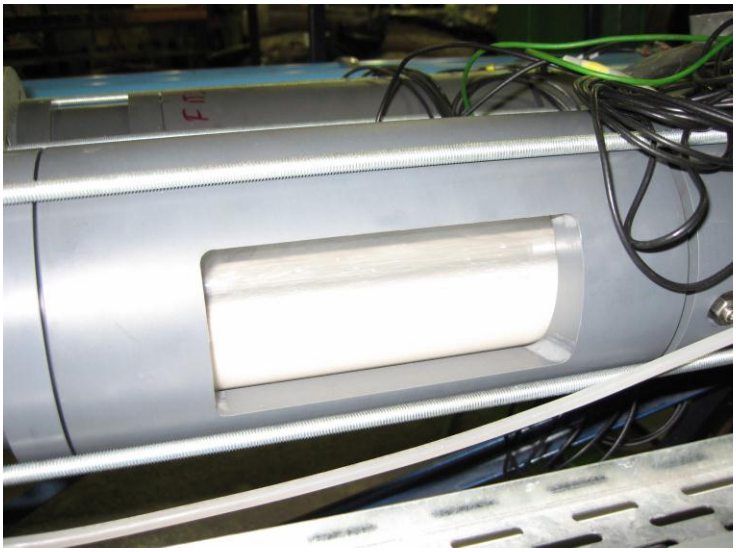


Figure 3.3: Glass viewing window

3.2.1 Pressure lines, pressure lines board and tappings

To measure the pressure gradients, pressure tappings were connected to differential pressure transmitters. Each tapping had a valve that allowed connection to a solids trap. Pressure lines were made of ¼" nylon pipe. Thus, the pressure was transmitted from pressure tappings to the differential pressure transmitters via solids traps. Each trap had a top valve for flushing the line and evacuating air bubbles, and a bottom valve for evacuating collected solids.
The valve board that was used to allow easy switching between tappings and pipes and to enable in-situ calibration is shown in Figure 3.4.

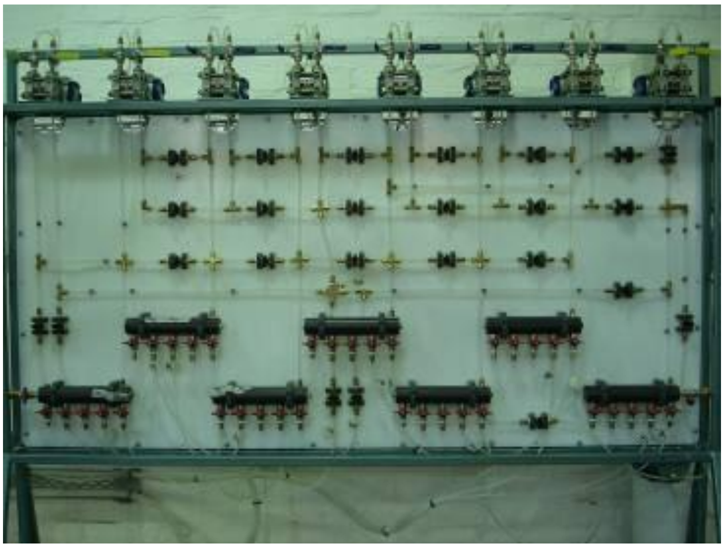


Figure 3.4: Valve board

3.2.2 Pressure transmitters

Differential pressure transmitters (Fuji FCX-CII, type FKKW35V4-AKCYY AA) with a range of 0 to 130 kPa were used to measure the pressure drop.

3.2.3 The hand-held communicator

The hand-held communicator (HHC) is a portable instrument which can communicate with differential pressure transmitters for zeroing, calibration, change of unit, range setting, etc. It was also used to check the data display with the logged values on the test program. The type of the hand held communicator that was used was a Fuji Electric FXW 10 AY1- A3.

3.2.4 Hardware and software

A data acquisition unit or data logger served to convert electrical signals from differential pressure transmitters, flow meters and tomography instruments connected to it into digital signals that were logged to the computer. The data logger program was written in C++ and was used with NI cards 6070 E (16SE/8DI.1.25MS/s. 12 bits). The data were written in binary format to file. A Visual basic program read in the binary data, calculated values by applying the calibration factors and standard deviations and wrote these to Microsoft Excel for further processing and presentation.

3.2.5 Flow meter

The flow rate was measured using a Fuji electric MAGFLO (MAG 5000) Φ80 mm flow meter (item 7 in Figure 3.1). It was mounted in the Φ80 mm vertical return line.

3.2.6 Electrical Resistance Tomography instrument

Electrical resistance tomography (ERT) was used to explore the inside of pipe cross-sections by inducing an electrical field through the section and making voltage measurements at 16 points around the pipe circumference. These measurements were used to generate images and solids concentration profiles which provide information about the dominant flow regime.

Tomographic images can be derived using several different physical phenomena. The technique used in the ERT produces data on internal condition from electrical measurements made at the surface or by electrodes in one or more bore holes. In principle, electrodes are positioned around the periphery of the region to be imaged and an electrical field is generated in that region. This is done by driving a current between two of the electrodes. The peripheral voltages resulting from this electrical field are then measured using the remaining electrodes. By repeating this process, selecting successive adjacent electrode pairs to drive current through, a data frame is built up that can be used to reconstruct an image or resistivity map of the measurement region (Long, 2006).

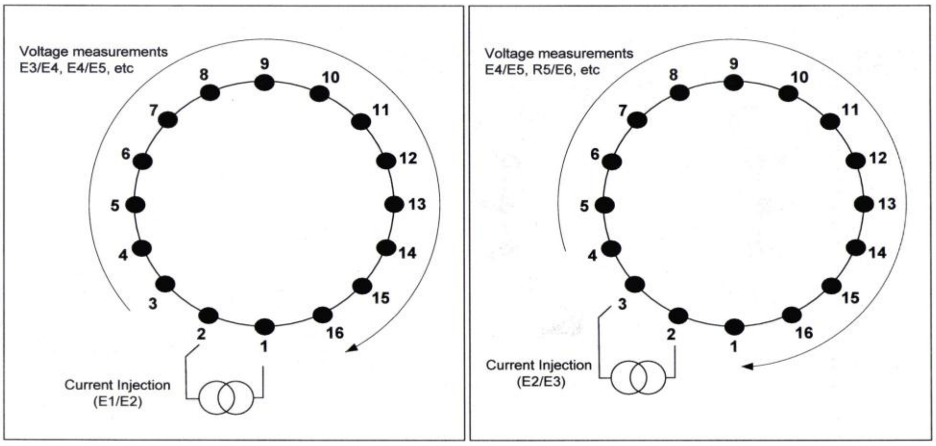


Figure 3.5: Adjacent pairs measuring sequence for a 16-electrode system. (Randall, Wilkinson, Long & Sutherland, 2008)

Figure 3.5 illustrates the principle of measuring sequence for a 16-electrode system. The figures show the first two positions of the current injection sequence. Output from the 16 amplifiers is recorded for each of the 16 current injection positions.

The ERT instrument used was developed at the University of Cape Town. It had a maximum of 8 planes and a total sampling rate of 1000 Hz. An adjacent pair "current injection" strategy was used as the measurement sequence (Randall *et al*., 2008). Current injections and voltage measurements were made on the same layer or section. In the present work, a sampling rate of

566 Hz was used. This has no effect on the image quality because the measurements taken were averaged.

For each current injection, on an adjacent pair of electrodes, 16 voltage measurements were made between neighbouring electrodes. Three of these measurements were then discarded, corresponding to the electrode pairs which share an electrode with the injection pair to result in 13 independent measurements per injection. Current injection was done on all sixteen electrode pairs resulting in a measurement set of 208 samples for each layer (Long, 2006).

Figure 3.6 shows examples of ERT electrode rings that were installed on the test loop. Each of the legs of the pipe test loop was equipped with a single ERT spool piece with three 16-electrode rings spaced at 50 mm then 100 mm apart, to give separation distances of 50, 100 and 150 mm.

Figure 3.6: ERT electrode rings mounted in the test loop.

3.3 Experimental procedures

In the present work pressure gradients and solids concentration profiles were used in determining flow patterns of the solid-liquid mixtures. Therefore this section explains how these important parameters were measured or determined.

3.3.1 Calibration

Prior to the pipe tests, calibration of the instruments for the appropriate ranges was done.

Differential pressure transmitters

The ranges of differential pressure transmitters (130 kPa instruments) were set appropriately and calibrated as follows:

- Each differential pressure transmitter was manually zeroed and checked with the hand held communicator when it was dry and no external pressure was applied across the diaphragm.
- The pressure transmitter was set to the desired pressure range using the hand held communicator.
- The high pressure side of the differential pressure transmitter was connected to an independently calibrated pressure gauge and the hand held communicator and pressure was applied by means of the bellows.
- The pressure recorded by the hand held communicator was read and the output DC voltage of the differential pressure transmitter was simultaneously read at the computer through the data acquisition system.
- The differential pressure was then decreased progressively and each time both the pressure on the hand held communicator and the voltage of the transducer on the data logger were read and recorded. The reading and recording were done for at least 6 different pressures.
- The calibration factors were obtained by linear regression of the pressure readings of the differential pressure transmitter and DC voltage outputs graph.

Figure 3.7 shows a typical example of calibration plot for a differential pressure transmitter (range: 0 to 24000 Pa).

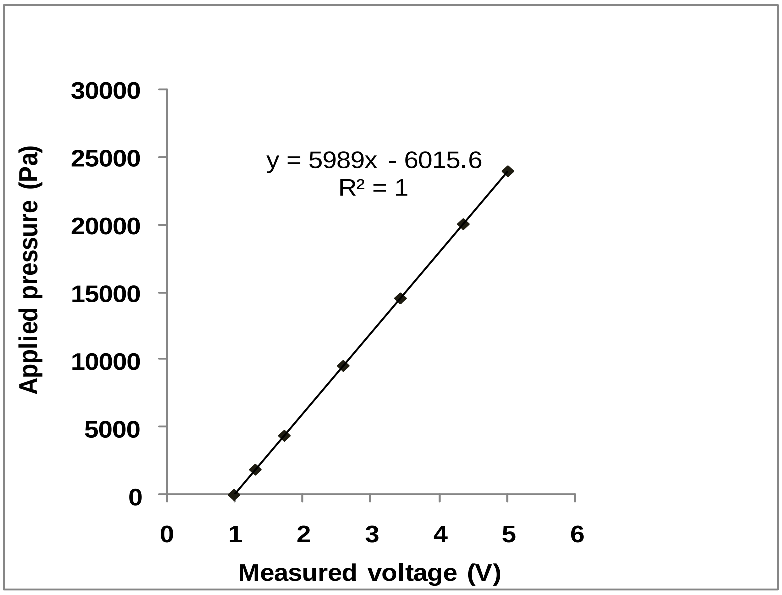


Figure 3.7: Calibration lines of differential pressure transmitter (DP1) 24 kPa span range

The recorded readings of applied pressures and the corresponding voltages of all the 24 kPa span range differential pressure transmitters used are displayed in Appendix A. The range was changed from 0 - 130 kPa to 0 - 24 kPa for better resolution during water tests.

Flow meter

The flow meter was factory calibrated and the lack of facility to calibrate it in the field led to the utilisation of the factory settings. The range of the flow meter was set to 0 to 50 l/s and the nominal calibration factors were used (output 4 to 20 mA, converted to 1 to 5 V). This yielded the calibration line expressed in Equation (3.1) where the flow rate was expressed in l/s.

$$Q = 12.5V^{*} - 12.5 \tag{3.1}$$

Tomography instruments

The calibration of the ERT instrument in question here does not mean the relationship between measured voltages and true solids concentration – as used, actual conductivity was not measured. This calibration refers to an internal set of measurements to account for differences in electrodes, etc. This routine captures a dataset which is used to calculate calibration factors. The procedure allows the user to specify for how long the instrument must run before capturing data used in the calibration calculations, and how many frames of data should be averaged to generate the dataset (Long, 2006). For these tests, the number of frames to be averaged was 500 and 1000 at three different current levels. So, the current can be lowered if necessary during a test with solids (as solids concentration increases) to avoid saturation.

3.3.2 Experimental technique

Pressure gradients were obtained for a particular mixture by measuring the pressure drop over a known length of pipe at different flow rates. Before running each mixture test, water tests were conducted to calibrate instruments (differential pressure transmitters, etc.) and the Colebrook-White equation was used to check the results (See for example Figure 4.1). Then, the required quantity (mass) of kaolin was added in at the mixing tank to make up the carrier fluid. During this process, the mixer was running to ensure homogenisation and samplings were done to check the relative density until the desired value was reached. During the recirculation of "carrier fluid only", rheology or viscometry tests were performed on the same rig to determine rheological parameters. Finally, the required quantity of sand was added at the mixing tank to achieve the required volumetric concentration of solids.

3.4 Instrument measurement error

Measurement error always exists due to various factors that may be natural (temperature, pressure, and humidity), instrumental (calibration, range, etc.), personal (poor sight of the experimenter), etc. Therefore, it is important to know to what extent errors affect measurements and how experimental data are affected by operations like addition, multiplication, division, root extraction, etc. This section deals with that and in particular with errors in pipe length and diameter, velocity and flow rate, pressure drop and pressure gradients.

3.4.1 Evaluation of Errors

Absolute and relative Error

The absolute error (Δx) is the difference between the true value (X) of any quantity and the measured or used value (x) for that quantity in a given circumstance. X is expressed as (Sive, 1988):

$$X = x \pm \Delta x \tag{3.2}$$

In this way, X lies between $x - \Delta x$ and $x + \Delta x$ and the relative error in the quantity X is given by the ratio: $\Delta x / x$.

Combined Errors

When a variable is a combination of other variables with their own associated errors, the total error is the combination of errors of all the independent variables. The expected error for a particular measurement can be determined if the functional relationship defining the measurement is known. In general, for X = fn ($a, b, c, \dots m$), the error in X due to measurement m or $(\Delta X)_m$ is found by (Holman, 2001):

$$\frac{(\Delta X)_m}{X} = \left(\frac{\partial X}{\partial m}\right)\frac{\Delta m}{X} = \left(\frac{\partial X}{\partial m}\right)\frac{m}{X}\frac{\Delta m}{m} \tag{3.3}$$

The maximum possible error in X is given by the sum of errors of the m contributory measured variables or quantities.

$$\left[\frac{(\Delta X)}{X}\right]_{\max} = \sum\left[\frac{\partial X}{\partial m} * \frac{m}{X} * \frac{\Delta m}{m}\right] \tag{3.4}$$

The expected highest error is given by the square root of the sum of the squared values of each term which ensures that all contributions will be positive.

$$\left[\frac{(\Delta X)}{X}\right]^2_{\exp} = \sum \left(\frac{\partial X}{\partial m}\right)^2 \left(\frac{m}{X}\right)^2 \left(\frac{\Delta m}{m}\right)^2 \qquad \textbf{(3.5)}$$

3.4.2 Errors in measured parameters

This subsection shows errors in parameters of major concern in this work.

Length

Lengths, for example the length of pipe or the axial distances between tapping points were measured using a measuring tape graduated in millimetres. The absolute error in these measurements was 0.5 mm.

Mass

The mass of samples were measured using an electronic balance. The absolute error in these measurements was 0.02 kg.

Pipe diameter

The pipe internal diameter was determined by weighing a mass of water M_w contained between the pressure tappings (distance L apart) in each pipe.
In this way, the pipe diameter can be expressed from the basic equation of the density as:

$$D = \sqrt{\frac{4M_w}{\rho_w \pi L}} \qquad \textbf{(3.6)}$$

Applying Equation (3.5) to Equation (3.6) in calculating the expected highest error in the pipe diameter D yields:

$$\frac{\Delta D}{D} = \frac{1}{2}\sqrt{\left(\frac{\Delta M_w}{M_w}\right)^2 + \left(\frac{\Delta L}{L}\right)^2} \qquad \textbf{(3.7)}$$

The expected highest errors in the measurements of pipe diameters of the rig are given in Table 3.1 noting that with water temperature equal to 18°C, water density is equal to 998.68 kg/m^3:

Table 3.1: Expected highest errors for a given pipe diameter

Nominal diameter OD (mm)	Mass of Water (kg) ±0.02	Length (m) ±0.001	Actual diam. ID (mm)	Expected highest Error or ΔD/D (%)
63	6.237	2.536	56	0.161
90	12.560	2.502	80	0.082

These expected highest errors on the measurement of pipe diameter are lower than what could be obtained from the tolerance (+0.2 mm) specified by the South African National Standard (2008) which gives 0.32% for 63 mm outside pipe diameter (OD). This means that the measured values fell within the tolerance.

Velocity and flow rate

The mean velocity in a pipe was determined from the following equation which is derived from the continuity equation:

$$V = \frac{Q}{A} \qquad \textbf{(3.8)}$$

The flow rate Q was measured using the magnetic flow meter. Applying Equation (3.5) to Equation (3.8) yields:

$$\frac{\Delta V}{V} = \sqrt{\left(\frac{\Delta Q}{Q}\right)^2 + 4\left(\frac{\Delta D}{D}\right)^2} \qquad \textbf{(3.9)}$$

The accuracy of the Fuji flow meter was 0.5% of the actual flow rate for velocities ≥ 0.5 m/s and was given by Equation (2.9) for velocities < 0.5 m/s (Fuji Electric, 1999).

$$\frac{\Delta Q}{Q} = \frac{0.25}{V(m/s)} * 100 \qquad \textbf{(3.10)}$$

Errors due to the measurement of pipe diameters are reported in Table 3.1. Therefore, the results of the expected highest errors for both test pipes are shown in Figure 3.8, which depicts the evolution of expected highest errors as a function of superficial velocity. It shows that errors are less than 3%. They are much lower for velocities greater than 0.35 m/s.

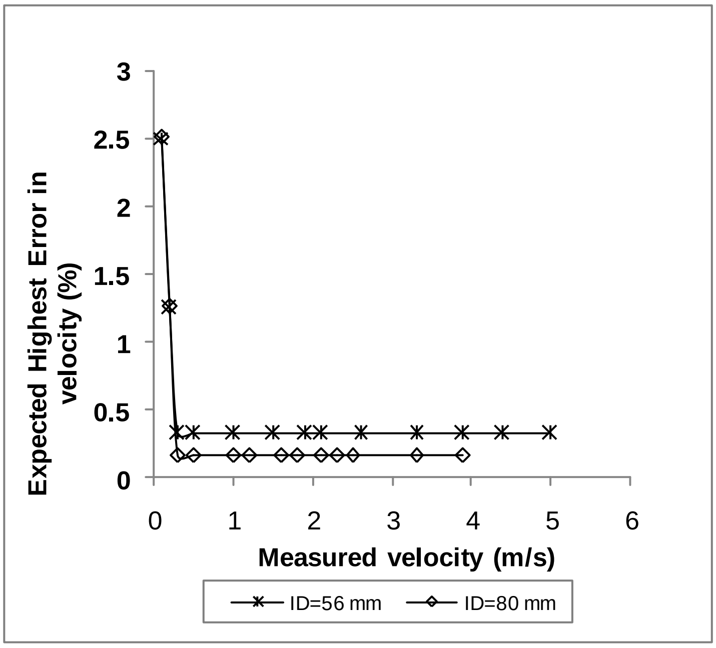


Figure 3.8: Expected highest errors in velocity for both 56 and 80 mm pipes

Pressure drop

The error in pressure drop is given by the accuracy of the differential pressure transmitters and the accuracy of the instrument used for calibration, which was in this case a hand held communicator. The differential pressure transmitters used were accurate to 0.1% of full scale (Fuji Electric, 2003). Care should be taken during the calibration procedure to ensure a coefficient of correlation of at least 0.999. For a differential pressure transmitter accurate to 0.25% for example, such calibration can yield an average error of 0.35% (Baudouin, 2003).

Pressure gradients

Applying Equation (3.5) to the pressure gradients ($\Delta P / L$) yields the following expression of expected highest errors in pressure gradients:

$$\frac{\Delta G}{G} = \sqrt{\left(\frac{\Delta(\Delta P)}{\Delta P}\right)^2 + \left(\frac{\Delta L}{L}\right)^2} \quad \textbf{(3.11)}$$

Equation (3.11) is implicit in velocity because of the relationship between velocity and pressure drop ΔP. This relationship is given by the Darcy-Weisbach equation (Equation (2.2)) and the Colebrook-white equation (Equation (2.10)) for the Fanning friction factor. Therefore, errors in experimental pressure gradients were evaluated (using Equation (3.11)) for all the sand mixtures tested in 56 mm pipe diameter. Noting that the error in pressure drop is given by 0.1% of the full range the differential pressure transmitter, these errors were found to be between 0.2

and 0.7%. The worst case (giving relatively higher error) concerned d56_k06ss1sc10 and is shown in Figure 3.9 for the range of velocity (1.5 to 5 m/s) over which this mixture was tested.

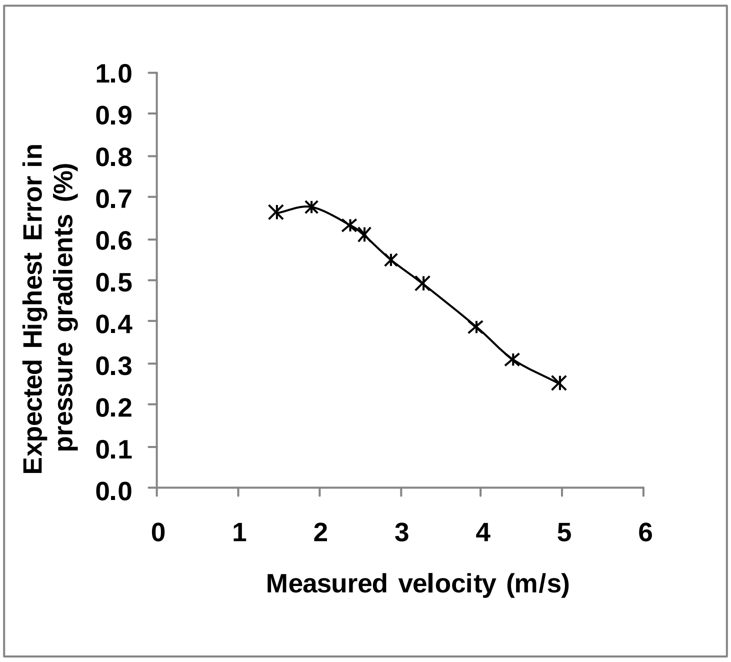


Figure 3.9: Expected highest errors in pressure gradients for d56_k06ss1sc10

3.5 Material tested

This section briefly describes the mixtures used in the present work as liquid – solid two phase flows and the materials used to prepare them.

3.5.1 Kaolin slurry

Dry kaolin was mixed with tap water to obtain kaolin slurries which were used as carrier fluids. Volumetric concentrations of 6, 10 and 15% were tested. Densities varied between 1096 and 1236 kg/m^3. Table 3.2 shows the physical properties of the kaolin used to make the carrier fluids.

Table 3.2: Properties of kaolin

Physical properties	Dimension (μm)	Quantity
Particle size distribution	<20 <10 <2	98% 90% 48%
Mean particle size (d_{50})	2.1	-
Residue (> 45 μm)	Maximum	0.15%
pH Value	-	4.0 - 5.0
Density of kaolin mineral	-	2600 kg/m^3
Moisture content	Maximum	1%

3.5.2 Sand in kaolin slurry

Silica sand was used as the coarse particles. Figure 3.10 shows particle size distribution for this sand and Figure 3.11 shows a picture of a sample of each of the sand sizes. From Figure 3.10 it appears that the solids were narrowly graded. The diameter of 50% of passing particles (d_{50}) was 1.3 mm for 1 mm sand size and 3.1 mm for 3 mm sand size. 1 mm and 3 mm are essentially used as labels for these two types of sand.

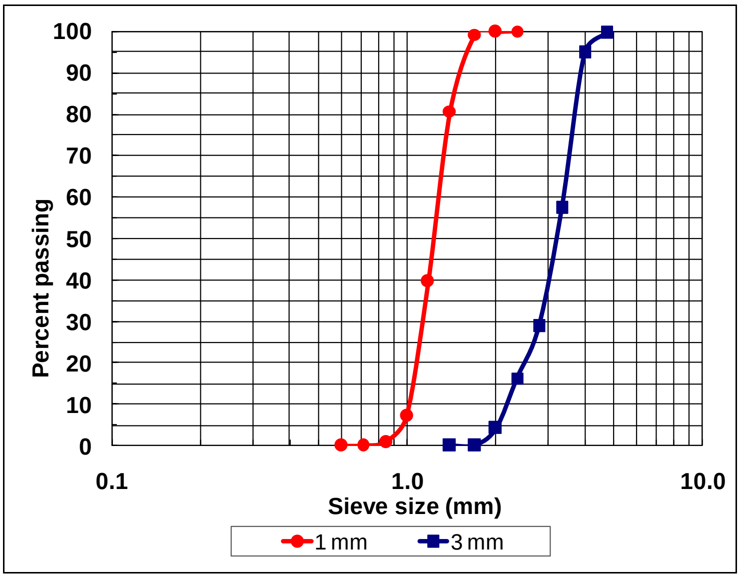


Figure 3.10: Particle size distribution for 1 mm and 3 mm sand sizes used

Figure 3.11: Silica sand samples (3 mm to the left and 1 mm to the right)

3.6 Conclusion

In this chapter, details of the experimental test loop and instruments used were presented. Experimental procedures (calibration, tests procedures) have been described and typical examples have been shown. Errors in velocity were found to be less than 3% at very low velocities. At velocities greater than 0.35 m/s, these errors were even much lower (less than 0.5%) All sand mixtures were tested beyond 1 m/s, except those based on 15% kaolin which could allow lower velocities (about 0.5 m/s). Errors in pressure gradients were found to be less than 1%, due to the high accuracy of the differential pressure transmitters used. For water relatively higher errors were expected because lower pressures were measured using the same range.

Chapter 4 Results

In order to evaluate the type of flow in the pipe, plots of frictional losses vs. superficial velocity were produced and analysed as well as particle concentration distribution in pipe cross section.

This chapter firstly presents in Section 4.1 typical water test results, run prior to each slurry test series to validate the system. Secondly, the results of the rheological characterisation of the carrier fluids used are shown in Section 4.2 and finally experimental results for different mixtures (sand slurries) are presented graphically in Section 4.3 as pressure gradients vs. superficial velocity. Electrical resistance tomography images are also incorporated into these pressure gradients vs. superficial velocity graphs to assess the suitability of the locally manufactured ERT instruments in determining flow patterns. ERT results are presented as cross-sectional colour maps (representing concentration; here conductivity) and as centre line vs. relative conductivities extracted from the image. Therefore, flow patterns could be established from the comparison of the pressure gradient profiles and the ERT results. Some sample data are given in Appendix C.

4.1 Water tests

Water tests were done in the pipe loop to evaluate the system correct functioning. An example of water test results is displayed in Figure 4.1 where Colebrook-White predictions and experimental values are shown for a smooth pipe (refer to Equation (2.10)). All water tests results were within ± 5% of results obtained from the Colebrook-White equation.

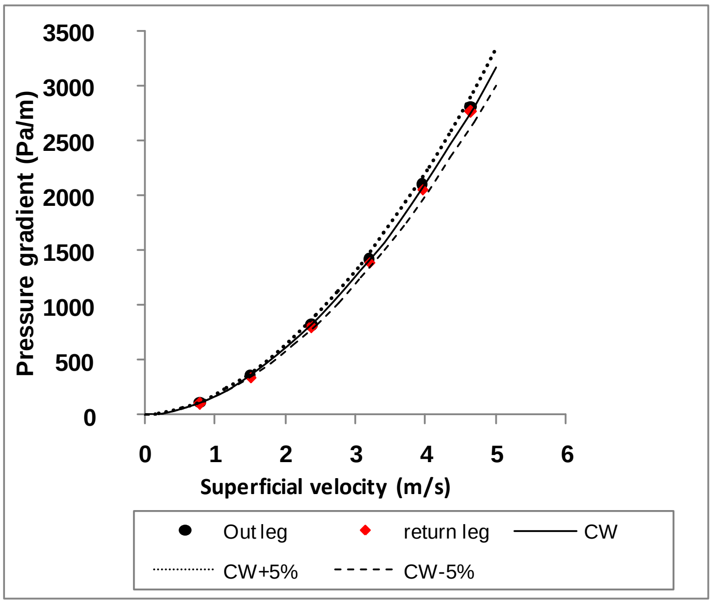


Figure 4.1: Water test results and Colebrook-White equation prior to the d56_K06ss1sc00 tests

4.2 Rheological characterisation of kaolin carrier fluids

Kaolin carrier fluids at nominal volumetric concentrations of 6, 10 and 15% were tested in the Φ56 mm pipe. Plots of shear stress vs. pseudoshear rate are shown in Figure 4.2.

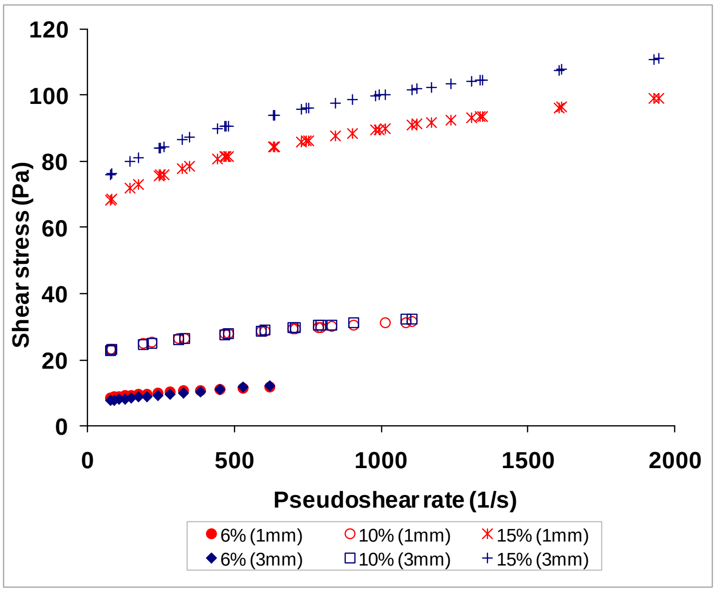


Figure 4.2: Rheology results for 6, 10 and 15% kaolin carriers before adding in 1 mm and 3 mm sand sizes

All mixtures of kaolin were characterised as yield pseudoplastic materials (Table 2.1) using the laminar flow data from the pipe tests. These data were fitted to Equation (2.12) to determine the constants τ_y, K and n . The shear stress vs. pseudoshear rate graph in Figure 4.3 shows typical fits of yield pseudoplastic flow curves for 6, 10 and 15% kaolin carrier slurries. These kaolin carriers were used for transportation of 1 mm sand size.

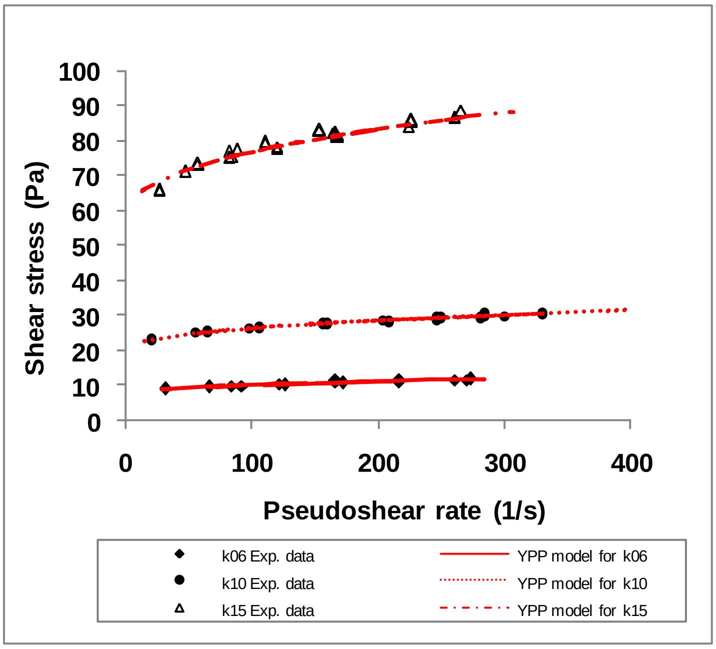


Figure 4.3: Fit of Yield PseudoPlastic (YPP) model to flow data of kaolin carrier fluids prior to adding 1 mm sand

The properties of all the kaolin carrier fluids used in this work are summarised in Table 4.1 where errors due to the rheological characterisation (errors of fit function) are less than 2%. The densities of these mixtures were obtained from the relative density tests.

Table 4.1: Fluid properties of 6, 10 and 15% kaolin prior to adding 1 mm or 3 mm sand

Material	Density (kg/m^3)	τ_y (Pa)	K (Pa.s^n)	n (-)	Fit function Error (%)
k06ss1	1096	7.34	0.0747	0.6435	1.90
k06ss3	1096	6.90	0.0416	0.7420	1.50
k10ss1	1160	19.35	0.3525	0.5192	1.86
k10ss3	1163	15.65	1.6746	0.3241	1.70
k15ss1	1229	55.46	1.2045	0.5000	1.91
k15ss3	1236	64.16	1.2241	0.5000	1.73

4.3 Pressure gradient vs. velocity plots with ERT tomograms and centreline concentration profiles

Due to the present limitations of the ERT instrument and the image reconstruction software, absolute values of concentration distribution in the cross-section of the pipe were not obtained. Therefore, conductivity values were “normalised” in order to obtain trends of concentration distribution. For a set of conductivity measurements done at various velocities, the “normalised” conductivity of a given point in the vertical centreline of the pipe cross-section was obtained from the ratio of the difference between the maximum conductivity of the set and the conductivity of the point under consideration to the difference between the maximum and minimum conductivities of the set. Caution is therefore needed since ERT results of different mixtures cannot be directly compared if the temperature is not kept the same. The procedure to reconstruct files and generate images and “concentration” profiles is explained in Appendix B.

Figure 4.4 is a typical example of ERT images and “concentration profiles” obtained at various superficial velocities for the case of 20% volumetric concentration sand of 3 mm size in 6% kaolin carrier. The mixture was pumped through the Φ56 mm pipe. Concentration profiles are displayed as a function of the normalised height of the measurement point (distance from the pipe invert divided by the diameter of the pipe) against the normalised relative conductivity. Conductivity values were obtained from ERT measurements and the ERT images of the cross-section of pipe were generated from an off-line processing of these measurements. Then, the images have been incorporated into the graphs of “concentration profiles” or concentration distribution across the cross-section of the pipe.

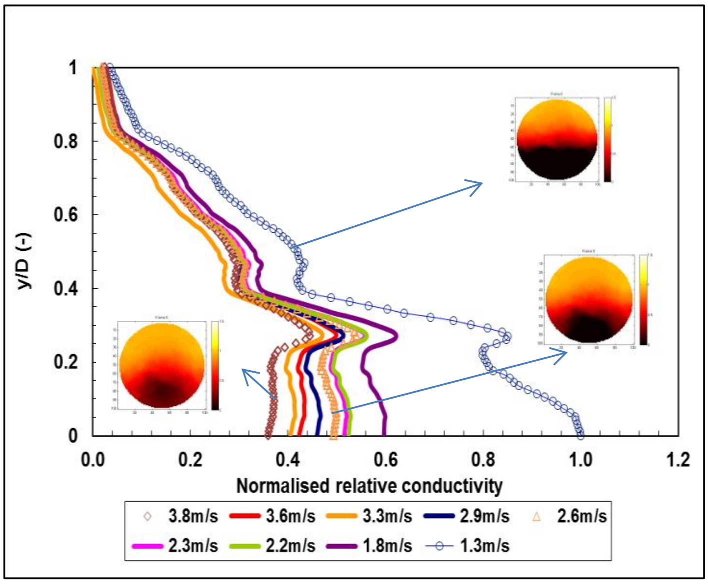


Figure 4.4: ERT images and "concentration profiles" at different velocities for d56_k06ss3sc20

To compare flow patterns obtained from the two methods (pressure gradients profiles and ERT results), tomography images have been incorporated into pressure gradient vs. velocity graphs and into the graphs of distribution of particle concentration along the vertical distance above the pipe invert. These two types of graphs are presented in Figure 4.5 to Figure 4.22 as pairs for each tested mixture. The pressure gradient profile of the carrier fluid alone is also displayed for comparison purposes.

4.3.1 Experimental results of mixtures of sand and 6% kaolin

This section presents pairs of graphs of pressure gradient as a function of velocity and selected corresponding concentration profiles for all the 1 mm sand and 3 mm sand in 6% kaolin mixtures. These graphs were plotted for 10, 20 and 30% sand concentrations.

Kaolin 6% with 1 mm sand at Cv 10, 20 and 30%

Figure 4.5 to Figure 4.7 shows pressure gradients and concentration profiles for 1 mm sand at 10, 20 and 30% volumetric concentrations in 6% kaolin. The superficial velocities ranged from 1.5 to 5 m/s for 10% sand concentration, 1.8 to 4.1 m/s for 20% sand concentration and from 1.7 to 4.2 m/s for 30% sand concentration.

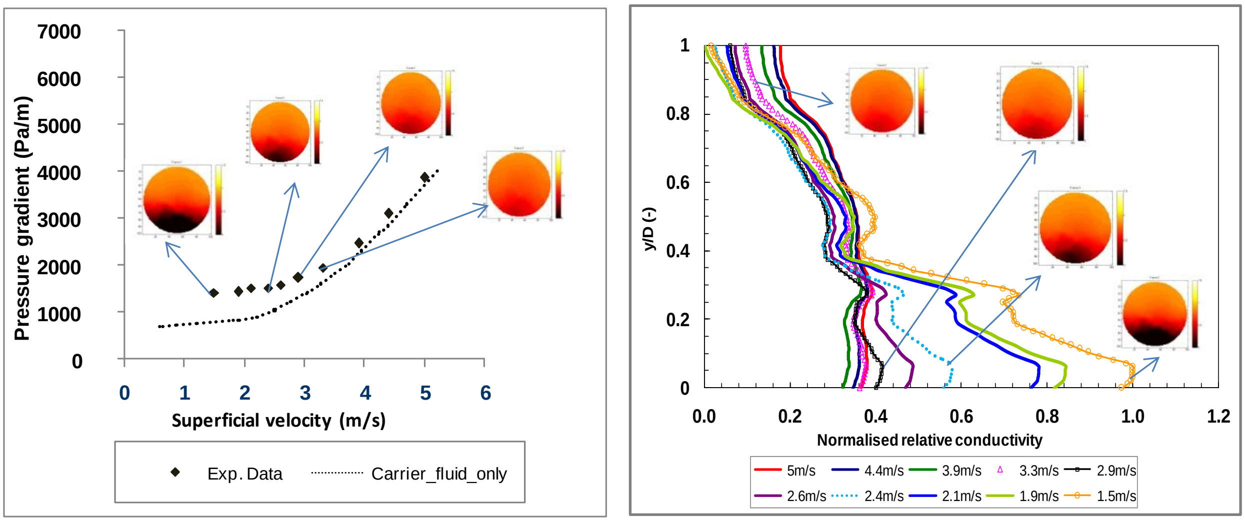


Figure 4.5: Pressure gradients and concentration profiles for d56_k06ss1sc10

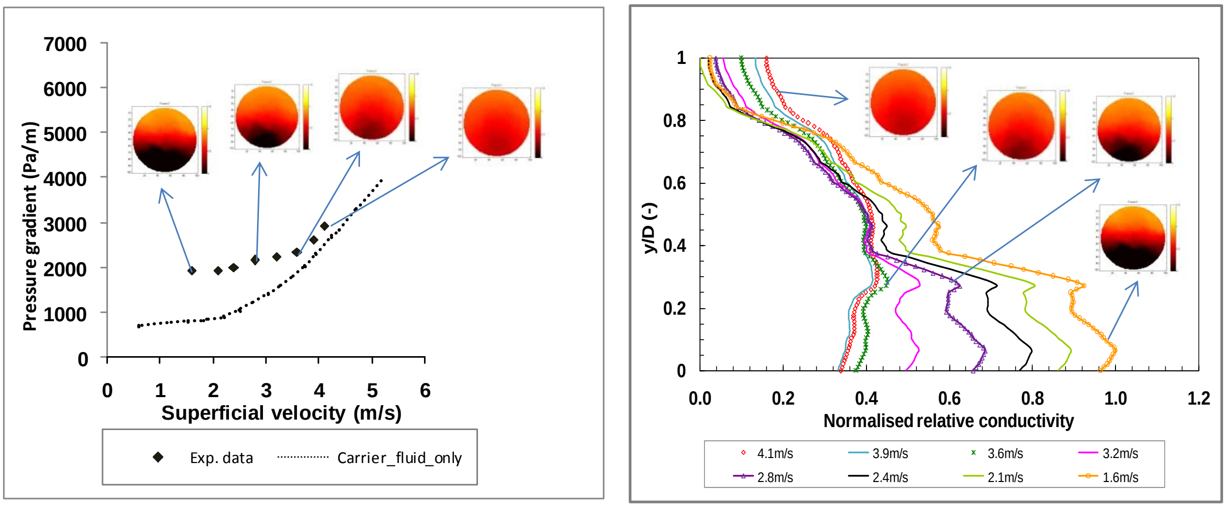


Figure 4.6: Pressure gradients and concentration profiles for d56_k06ss1sc20

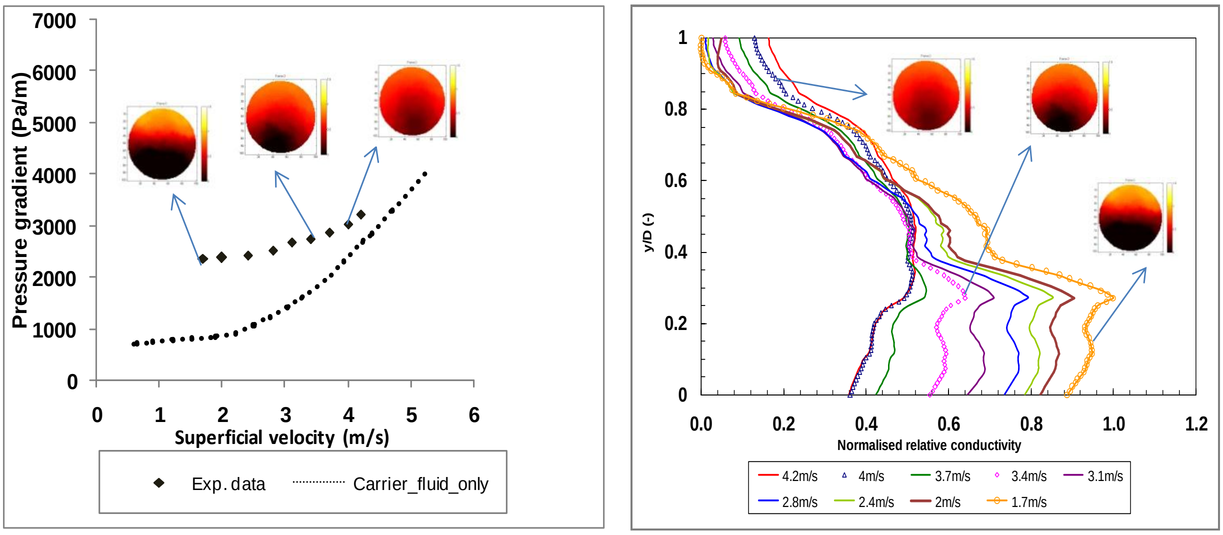


Figure 4.7: Pressure gradients and concentration profiles for d56_k06ss1sc30

Kaolin 6% with 3mm sand at Cv 10, 20 and 30%

Figure 4.8 to Figure 4.10 represent pressure gradient and concentration profiles for 3 mm sand at 10, 20 and 30% volumetric concentrations in 6% kaolin. The superficial velocities ranged from 1.5 to 4.5 m/s for 10% sand concentration, 1.3 to 3.8 m/s for 20% sand concentration and from 1.6 to 3.9 m/s for 30% sand concentration.

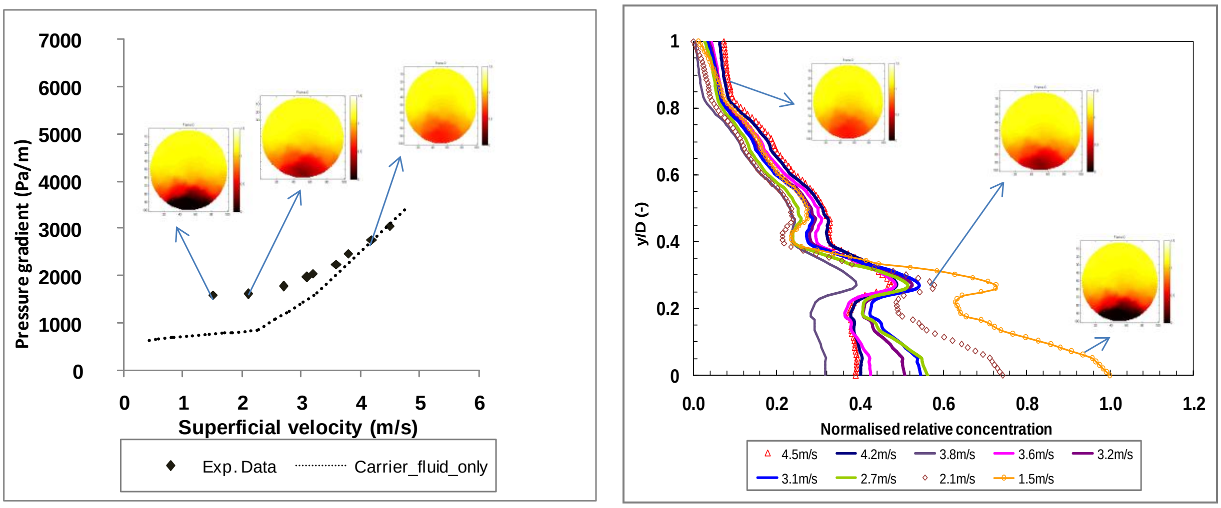


Figure 4.8: Pressure gradients and concentration profiles for d56_k06ss3sc10

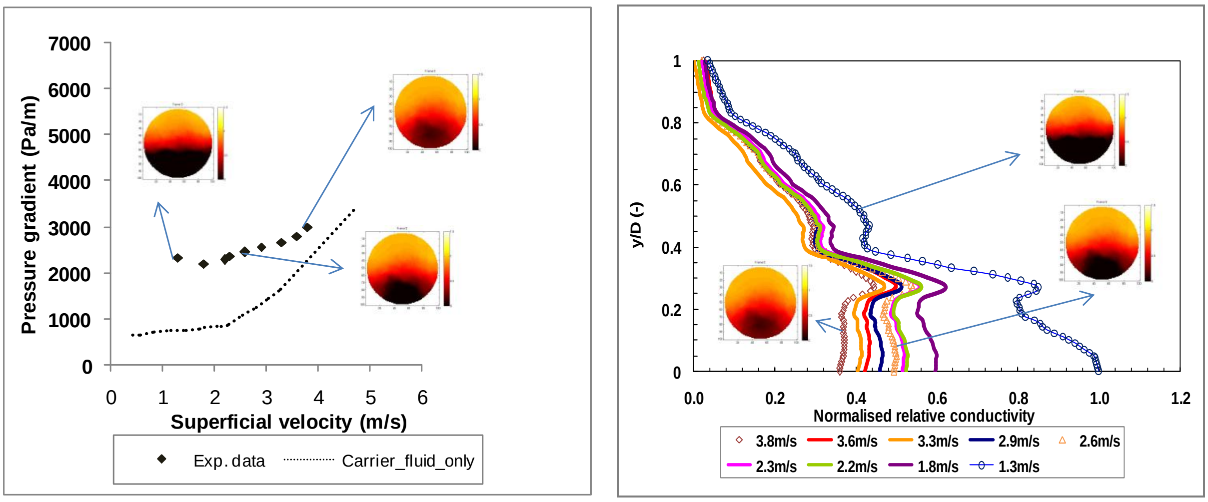


Figure 4.9: Pressure gradients and concentration profiles for d56_k06ss3sc20

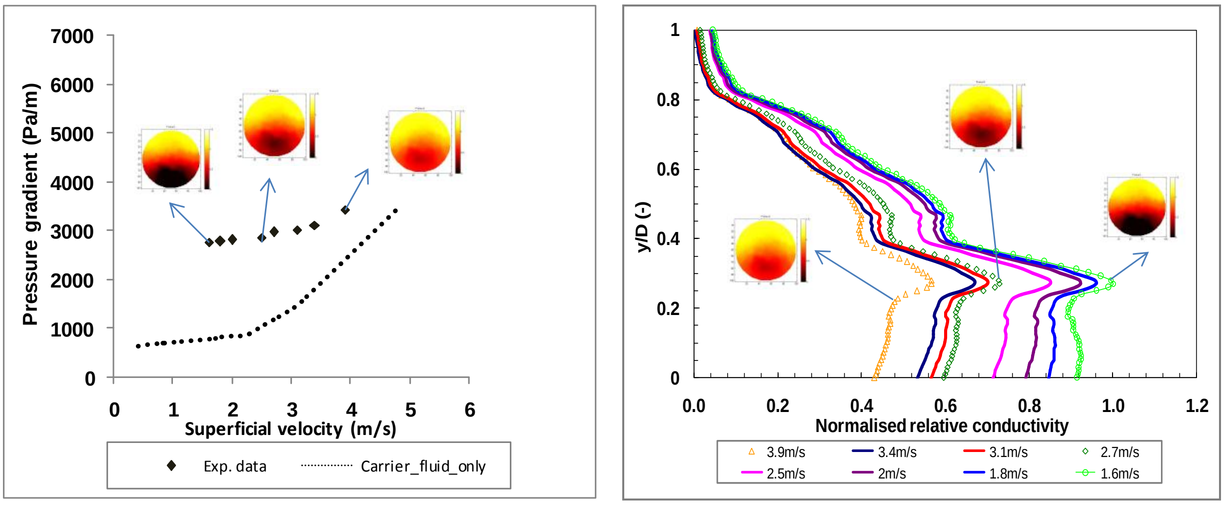


Figure 4.10: Pressure gradients and concentration profiles for d56_k06sss3sc30

4.3.2 Experimental results of mixtures of sand and 10% kaolin

Pairs of graphs of pressure gradient as a function of velocity and selected corresponding concentration profiles for all the 1 mm sand and 3 mm sand in 10% kaolin mixtures are presented in this subsection. These graphs were plotted for 10, 20 and 30% sand concentrations.

Kaolin 10% with 1 mm sand at Cv 10, 20 and 30%

Figure 4.11 to Figure 4.13 represent pressure gradient and concentration profiles for 1 mm sand at 10, 20 and 30% volumetric concentrations in 10% kaolin. The superficial velocities ranged from 1.2 to 6 m/s for 10% sand concentration, 1.5 to 4.7 m/s for 20% sand concentration and from 1.4 to 4.7 m/s for 30% sand concentration.

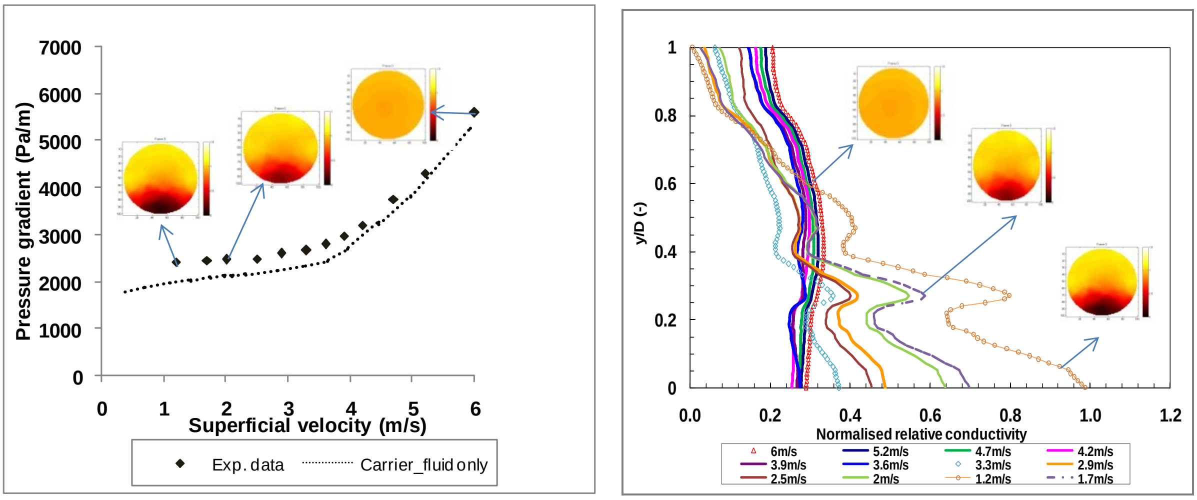


Figure 4.11: Pressure gradients and concentration profiles for d56_k10ss1sc10

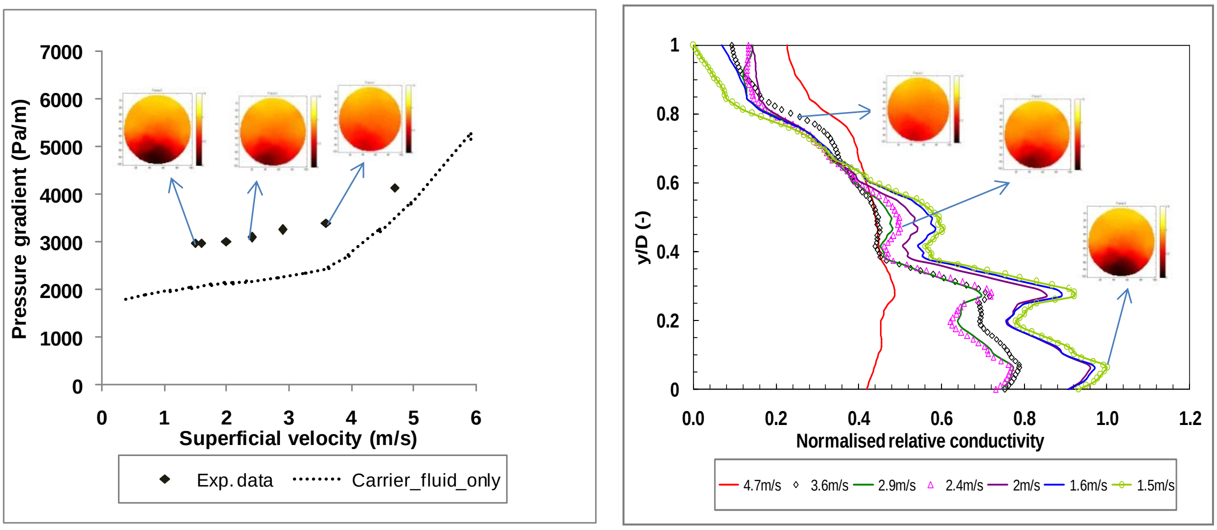


Figure 4.12: Pressure gradients and concentration profiles for d56_k10ss1sc20

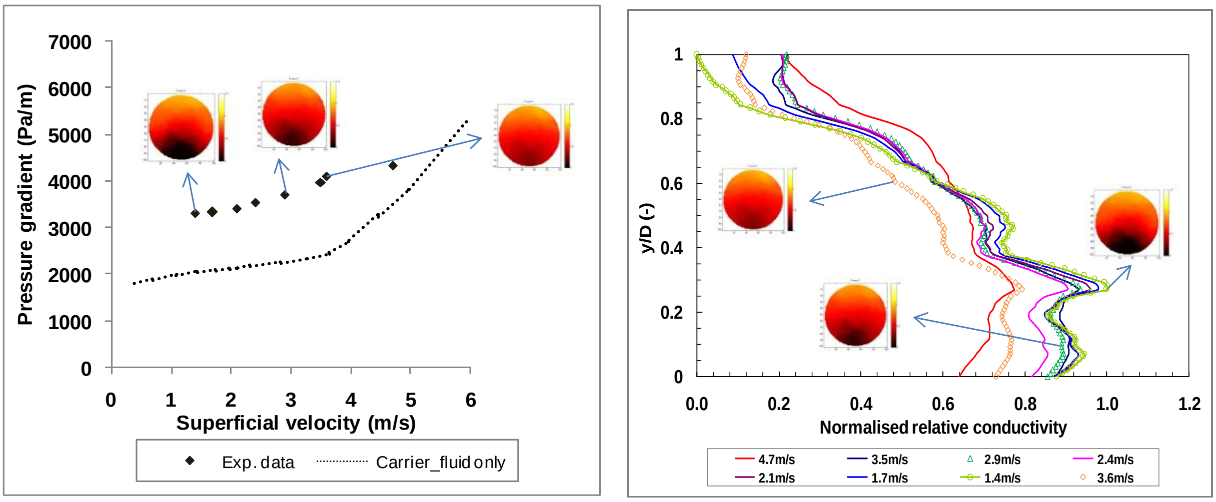


Figure 4.13: Pressure gradients and concentration profiles for d56_k10ss1sc30

Kaolin 10% with 3 mm sand at Cv 10, 20 and 30%

Figure 4.14 to Figure 4.16 represent pressure gradient and concentration profiles for 3 mm sand at 10, 20 and 30% volumetric concentrations in 10% kaolin. The superficial velocities ranged from 1 to 4.9 m/s for 10% sand concentration, 0.9 to 4.3 m/s for 20% sand concentration and from 1.5 to 4.9 m/s for 30% sand concentration.

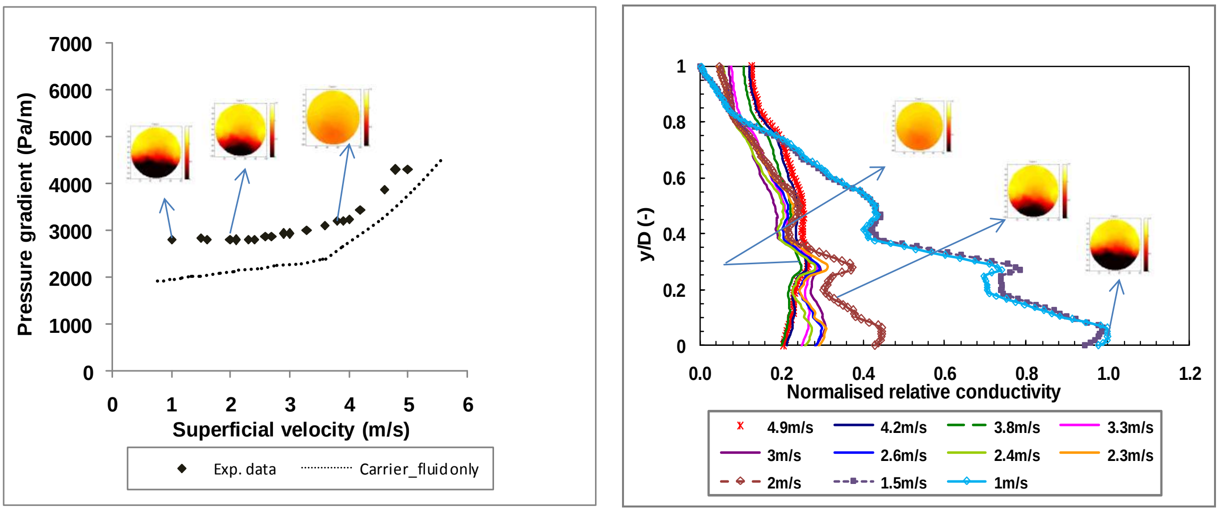


Figure 4.14: Pressure gradients and concentration profiles for d56_k10ss3sc10

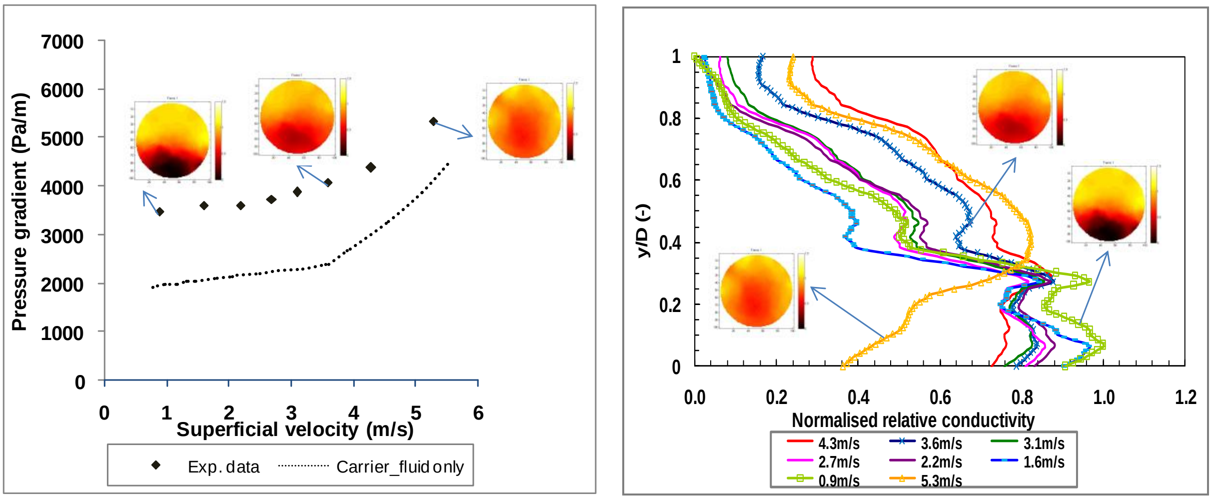


Figure 4.15: Pressure gradients and concentration profiles for d56_k10ss3sc20

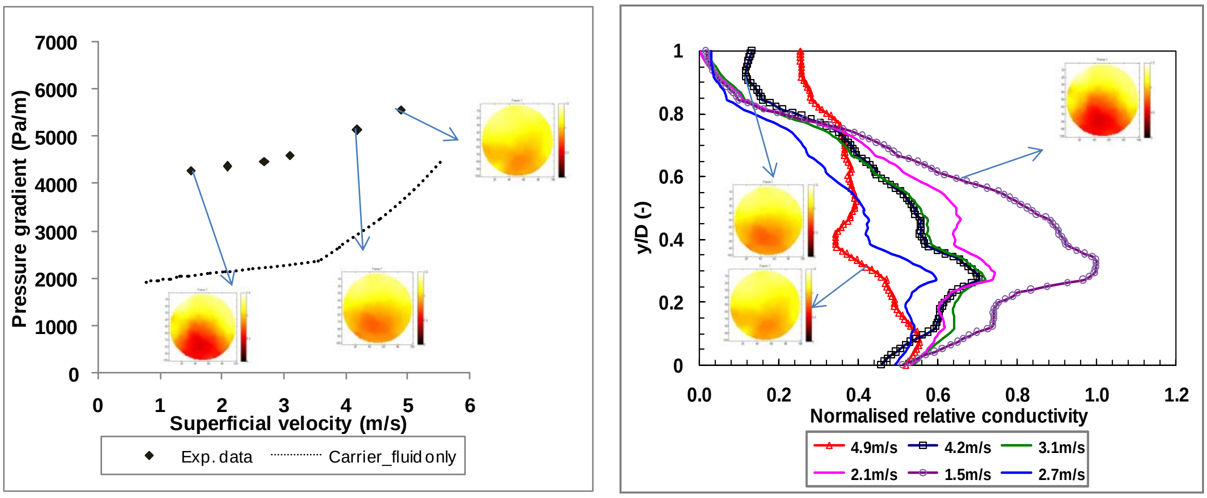


Figure 4.16: Pressure gradients and concentration profiles for d56_k10ss3sc30

4.3.3 Experimental results of mixtures of sand and 15% kaolin

Pairs of graphs of pressure gradient as a function of velocity and selected corresponding concentration profiles for all the 1 mm sand and 3 mm sand in 15% kaolin mixtures are shown here. As in the case of 6 and 10% kaolin carrier, these graphs were plotted for 10, 20 and 30% sand concentrations.

Kaolin 15% with 1 mm sand at Cv 10, 20 and 30%

Figure 4.17 to Figure 4.19 depict pressure gradient and concentration profiles for 1 mm sand at 10, 20 and 30% volumetric concentrations in 15% kaolin. The superficial velocities ranged from 0.4 to 5 m/s for 10% sand concentration, 0.7 to 5.2 m/s for 20% sand concentration and from 0.6 to 4.7 m/s for 30% sand concentration.

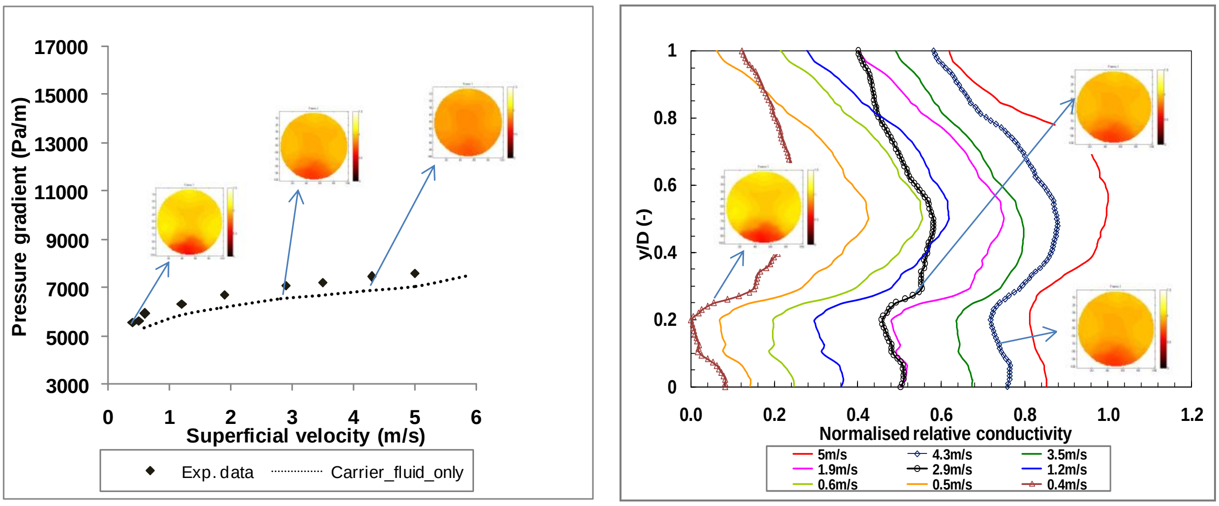


Figure 4.17: Pressure gradients and concentration profiles for d56_k15ss1sc10

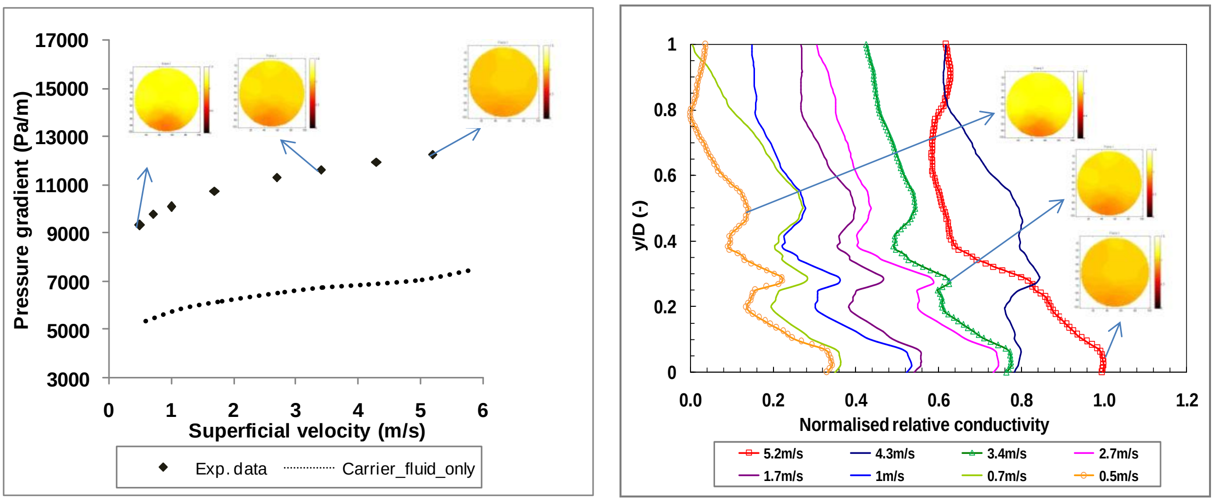


Figure 4.18: Pressure gradients and concentration profiles for d56_k15ss1sc20

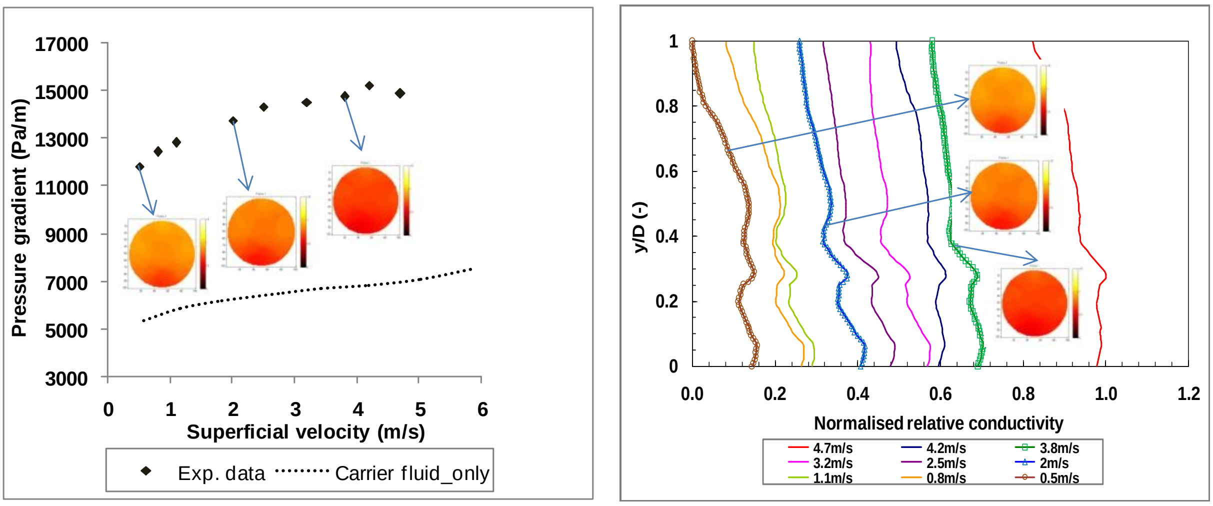


Figure 4.19: Pressure gradients and concentration profiles for d56_k15ss1sc30

Kaolin 15% with 3 mm sand at Cv 10, 20 and 30%

Figure 4.20 to Figure 4.22 display pressure gradient and concentration profiles for 3 mm sand at 10, 20 and 30% volumetric concentrations in 15% kaolin. The range of superficial velocities was 0.4 to 4.5 m/s for 10% sand concentration, 0.5 to 4.2 m/s for 20% sand concentration and 0.6 to 3.8 m/s for 30% sand concentration.

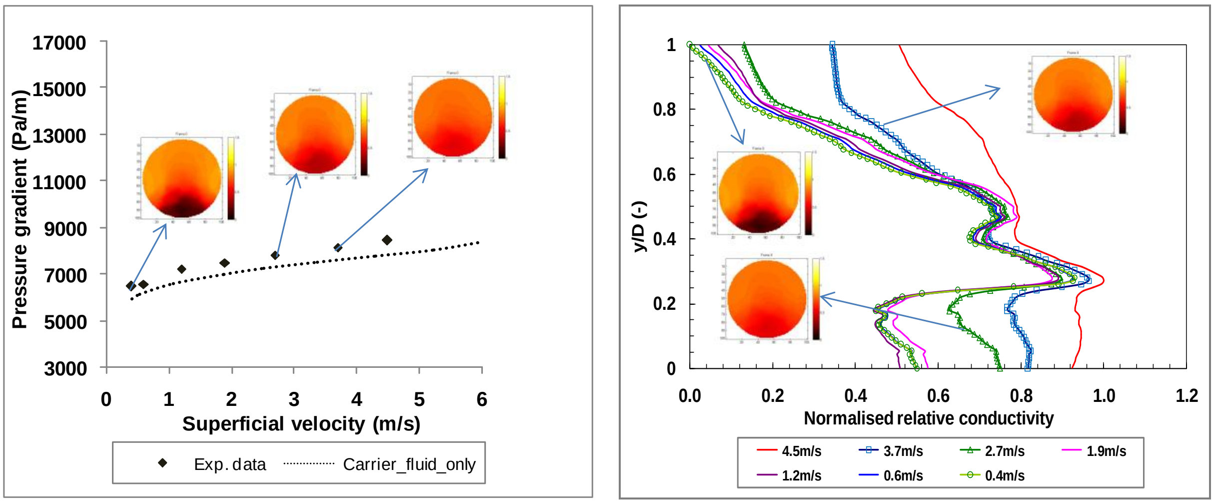


Figure 4.20: Pressure gradients and concentration profiles for d56_k15ss3sc10

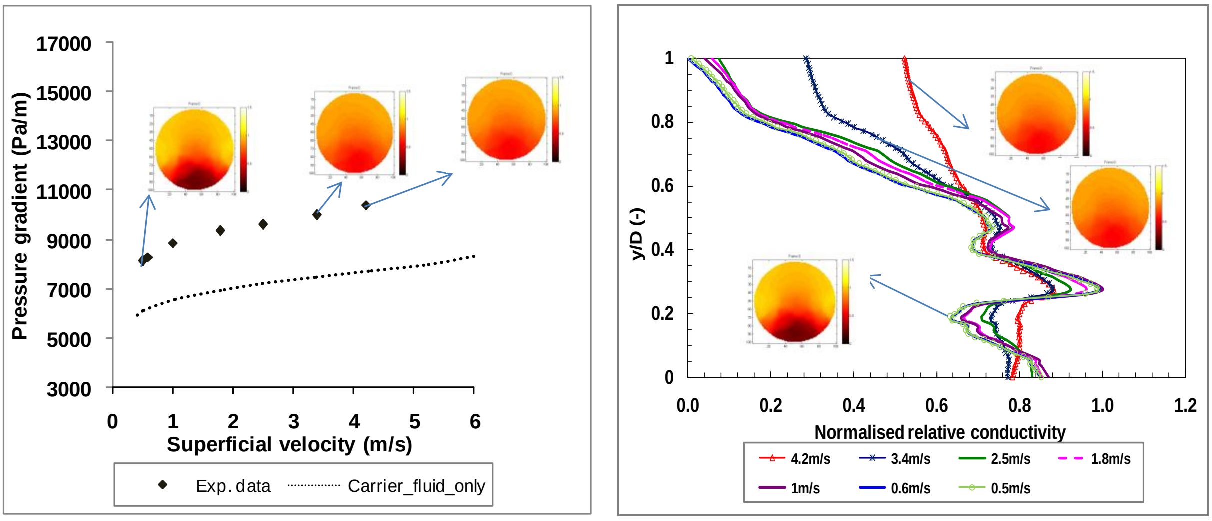


Figure 4.21: Pressure gradients and concentration profiles for d56_k15ss3sc20

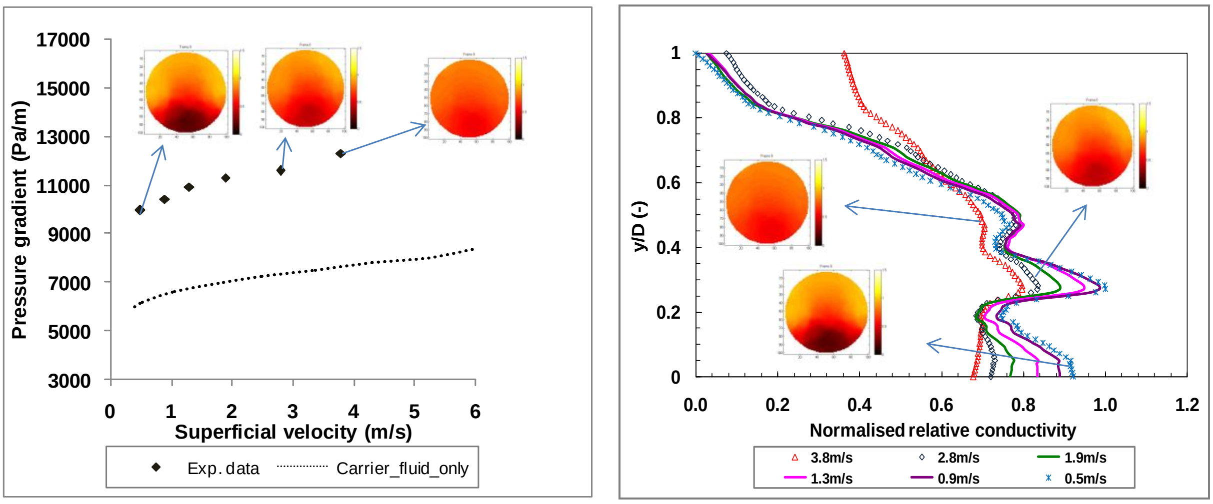


Figure 4.22: Pressure gradients and concentration profiles for d56_k15ss3sc30

4.4 Conclusion

This chapter presented representative results obtained from kaolin/sand mixtures in pipe test loop. The results from the pressure gradient measurements were displayed along those from the tomography instruments for comparison purposes. Before testing the flow of non-Newtonian sand mixtures in pipe, instruments were calibrated and water tests were conducted, which were all within ±5% of the Colebrook-White prediction. Rheological characteristics of different carrier fluids used were measured using tube viscometry. The yield pseudoplastic model was used to characterise all the kaolin solutions and graphs of shear stress versus shear rate showed good fits of the model to experimental points. All these considerations show that the test apparatus was reliable. The experimental results are discussed in Chapter 5.

Chapter 5 Discussion of results

This chapter deals with the ability of the ERT system to identify flow patterns of coarse particles. Firstly, pressure gradient vs. velocity plots are presented to identify flow patterns for the various mixtures. Secondly, the excess pressure drop due to the presence of coarse particles is evaluated for the various mixtures. Thirdly, the vertical centreline concentration distributions are extracted from the tomograms to see whether they are consistent with the pressure gradient vs. velocity plots in identifying the flow patterns, i.e. moving bed or heterogeneous flows.

5.1 Evaluation of pressure gradient vs. velocity plots

Results of flow of the sand in kaolin (two-phase) mixtures are grouped in Figure 5.1 as pressure gradients vs. superficial velocity charts for each sand concentration. These graphs were plotted for different kaolin carrier concentrations (6, 10 and 15%) and sand sizes 1 and 3 mm. They were plotted to the same scale for easy comparison.

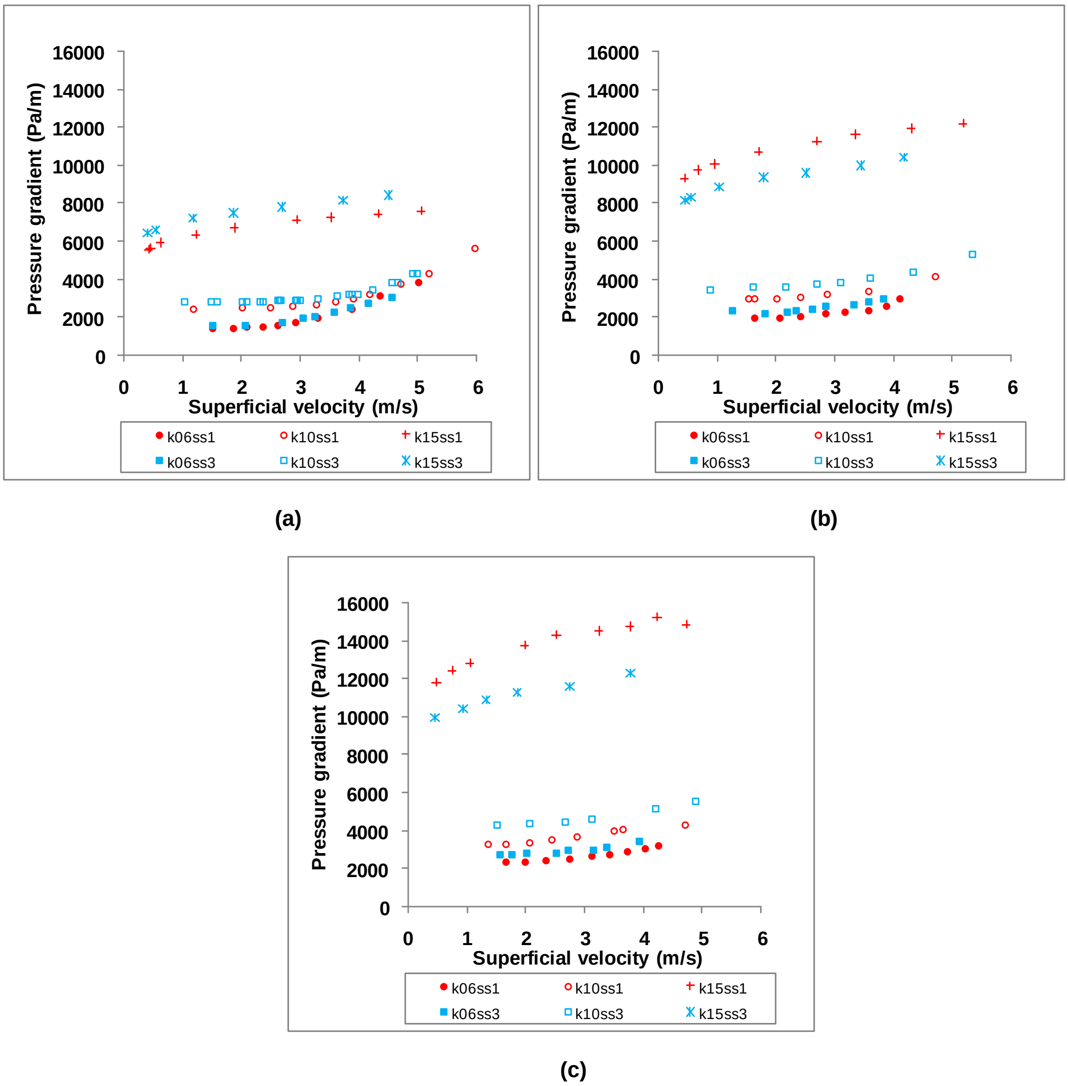


Figure 5.1: Pressure gradient profiles obtained for 1 mm and 3 mm sand sizes at (a) 10% by volume, (b) 20% by volume and (c) 30% by volume in 6, 10 and 15% kaolin carriers

Figure 5.1(a) shows that at low sand concentration (10%) and for a given kaolin carrier concentration, the pressure gradients profile of 1 mm sand size lies below that of 3 mm sand size and that the sand size does not have a significant impact on pressure gradients. This suggests that the flow was dominated by viscous properties of carrier fluids. However, for 15% kaolin carrier there was a big jump between the flow curve of 1 mm sand and that of 3 mm sand size which was due to the initial difference in two kaolin carriers that were prepared for the two sand sizes.

In Figure 5.1(b) and Figure 5.1(c) the flow curves of 1 mm sand and those of 3 mm sand in 15% kaolin are swapped around with this time the pressure gradients profiles of 1 mm being above those of 3 mm sand size. A possible explanation for this would be that with a homogeneous flow appearance at 15% kaolin carrier and at moderate (20%) and high (30%) sand concentrations there are more solids collisions for 1 mm sand than there are for 3 mm, which lead to higher pressure gradients. This trend was consistent with the observation made by Wilson (2004) who noted that the close particle spacing at high concentration reduces the effectiveness of turbulent suspension, so that the submerged weight of solid particles must be carried by granular contact, leading to larger pressure gradients and a pronounced rise in specific energy consumption with further increases in solids volumetric concentration. The difference from Wilson's results is that in the present case turbulent suspension is not involved but yield stress support of the kaolin carrier fluid. His experiments were done for sand in water.

Figure 5.1(a) to (c) show that the shape of the pressure gradients vs. velocity curves changes from the typical layered flow curve at kaolin concentration of 6% and 10% to an almost homogeneous flow appearance for the 15% kaolin carrier. This change in the shape of the curve was independent of the particle size. A similar phenomenon was observed in Peker & Helvaci (2008) for mixtures of 125 and 440 µm (with the particle size distributions ranging from 0.05 to 879 µm) particles in water. The solid particle concentrations ranged from 10% to 50% volume. It was found that the pressure curves corresponding to different solid particle concentrations converged to a single curve at velocities above 4 m/s. In their case, at solid concentrations equal to or greater than 20%, a minimum was observed in the pressure gradient, which signifies the formation of stratified flow, with the velocity corresponding to minimum pressure being the limit deposit velocity (Peker & Helvaci, 2008).

In the case of coarse particles (1 mm and 3 mm sand in kaolin) presented here the same trends were observed except that the minimum was observed even for 10% solid concentration and no minimum was observed in 15% kaolin carrier. The pseudohomogeneous flow appearance at high kaolin concentration was due to high yield stress support. It also appeared from Figure 5.1(a) to (c) that for the same sand concentration and superficial velocity, increasing the kaolin carrier concentration increases the overall pressure gradient of the kaolin-sand slurry. Furthermore the comparison of these three graphs showed that the sand concentration does not change the shape of the curve or the flow pattern. However, pressure gradients increase as the sand concentration increases.

Results obtained by Vlasak *et al*. (2002) have been replotted in Figure 5.2 and Figure 5.3 along with those of the mixtures tested in the present work whose volumetric concentrations were in the same range. Vlasak's results were obtained in a smaller pipe diameter (26.8 mm). This is the reason why the transition from laminar regime to turbulent regime happens earlier compared to results obtained in Φ56 mm pipe and Vlasak's pressure gradients curves lie above those obtained in Φ56 mm pipe. However the resistance curves in these two pipe diameters show similar trends in the laminar and turbulent regimes. This validates the experimental results in Φ56 mm pipe.

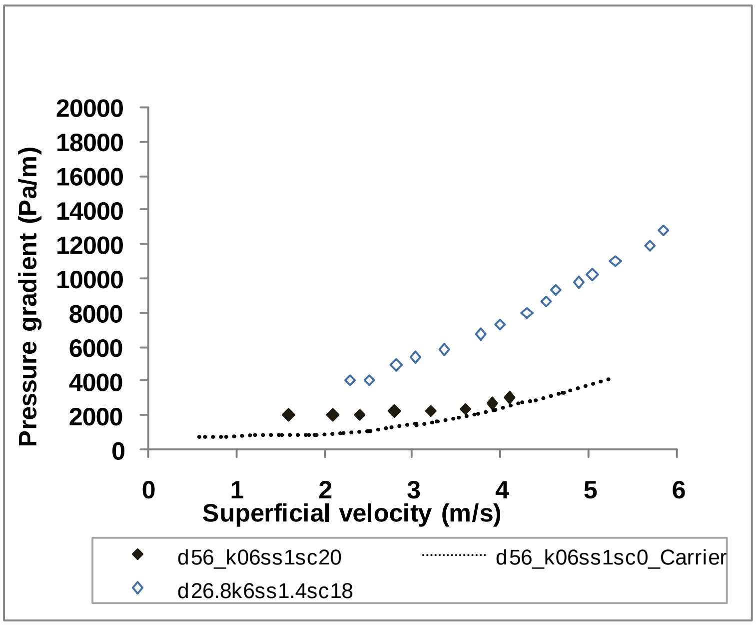


Figure 5.2: Comparison of pressure gradients curve for d56_k06ss1sc20 with Vlasak *et al*. (2002) results

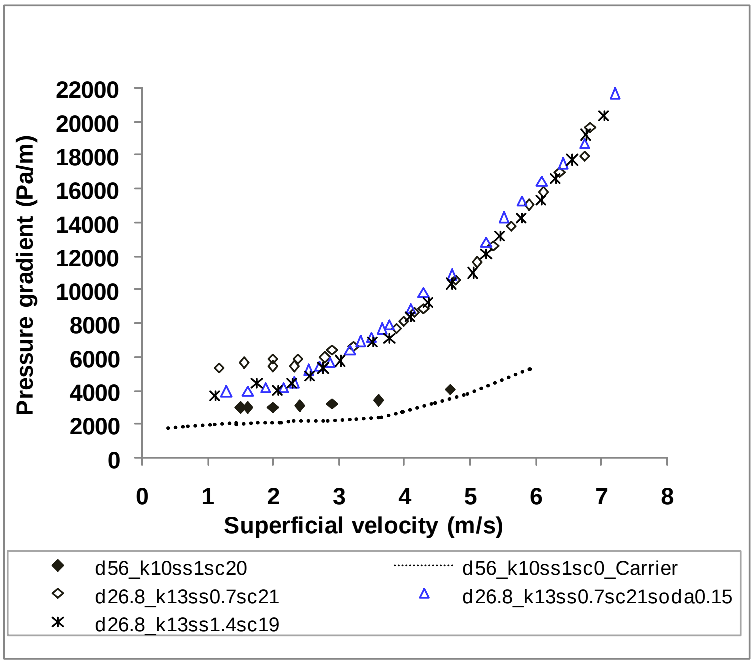


Figure 5.3: Comparison of pressure gradients curve for d56_k10ss1sc20 with Vlasak *et al*. (2002) results

5.2 Excess pressure drop due to the presence of coarse particles

The excess pressure gradient due to the presence of coarse particles was derived for a given velocity from the difference between the total pressure gradient of the sand mixture and that of the carrier fluid only over the pressure gradient due to the carrier fluid alone. It is the pressure over and above that of the carrier fluid. This ratio was given by:

$$\left(\frac{\Delta P_{Excess}}{L}\right) = \frac{(\Delta P/L)_{total} - (\Delta P/L)_{carrier}}{(\Delta P/L)_{carrier}} \quad \textbf{(5.1)}$$

5.2.1 Excess pressure gradient of coarse particles at different sand concentrations

Figure 5.4 to Figure 5.6 were derived from Figure 5.1 and Figure 4.2 and show the plots of the excess pressure gradients induced by the presence of solid particles. In these graphs the tested mixtures were grouped by sand concentration. These graphs are discussed in this section and in Section 5.2.2.

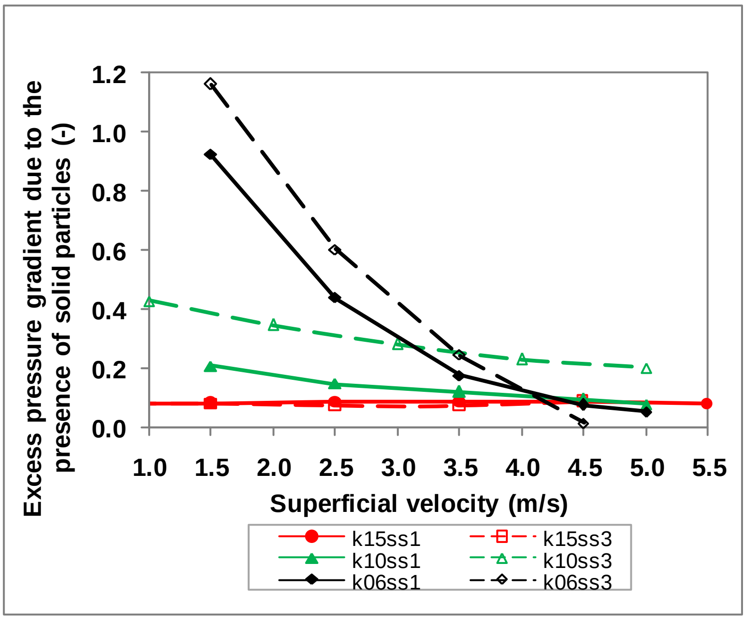


Figure 5.4: Effect of 10% sand concentration in 6, 10 and 15% kaolin carriers for 1 mm and 3 mm sand sizes

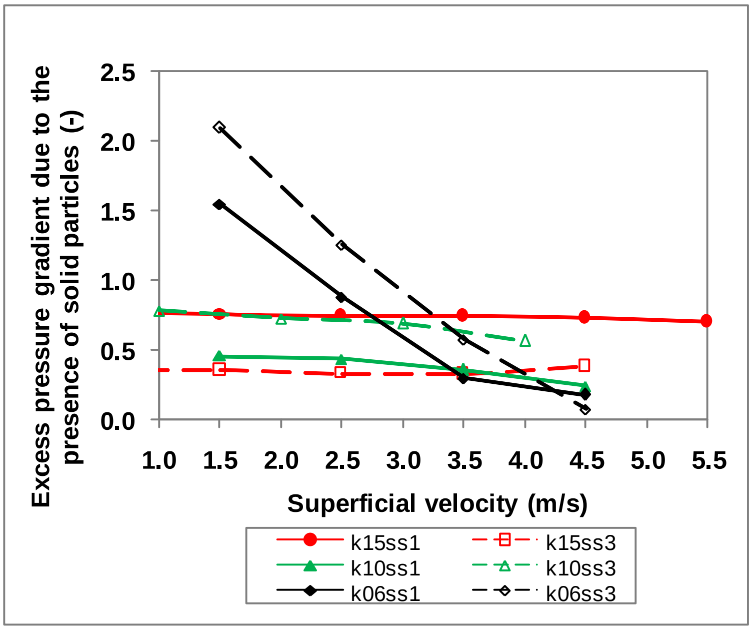


Figure 5.5: Effect of 20% sand concentration in 6, 10 and 15% kaolin carriers for 1 mm and 3 mm sand sizes

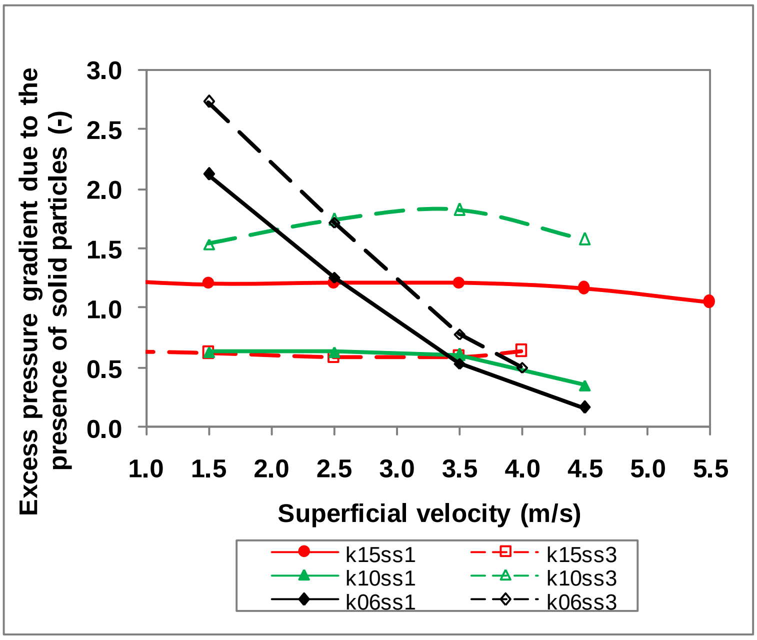


Figure 5.6: Effect of 30% sand concentration in 6, 10 and 15% kaolin carriers for 1 mm and 3 mm sand sizes

10% sand concentration

Figure 5.4 shows that for 15% kaolin the excess pressure gradient due to coarse particles was approximately 8% of the carrier alone pressure gradients for both 1 and 3 mm sand sizes and over the entire velocity range. For 10% kaolin with 1 mm it decreased approximately linearly from 21% at 1.5 m/s to 8% at 5 m/s.

For 10% kaolin with 3 mm sand the same trend was apparent, but with higher excess pressure gradients ranging from 43 to 20% over the velocity range. For 6% kaolin with 1 mm sand it decreased linearly from 92% at 1.5 m/s to 17% at 3.5 m/s, after which it leveled off at 6%. For 6% kaolin with 3 mm sand it decreased linearly from about 120% at 1.5 m/s to almost 0% at 4.5 m/s.

The excess pressure drop due to the presence of sand decreased approximately linearly with an increase in velocity for all sand sizes and concentrations in the 6% carrier fluid. This was due to low carrier fluid concentration. Similar trends were obtained by Vlasak *et al*. (2002) (see Figure 2.11). As stated in Section 2.4.2, the excess pressure gradients in these results decreased more rapidly for coarser sand (1.4 mm) and medium sand (0.7 mm) than for finer sand (0.2 mm) becoming even less than those of fine sand in the case of medium sand from 4.5 m/s upwards.

20% sand concentration

It can be seen from Figure 5.5 that the excess pressure gradients profiles for 20% sand in 10 and 6% carriers were the same as the corresponding ones in the 10% sand case. However, for both 10 and 6% kaolin carriers the excess pressure gradients due to coarse particles increased by an average of 35% from the 10% case. For kaolin 15% the excess pressure gradient due to 3 mm sand increased 4 times and for 1 mm sand more than 6 times over the entire velocity range. This could be a manifestation of the effect of interparticle collisions of suspended solids as shown in Wilson (2004) and discussed in Section 5.1.

30% sand concentration

It can be seen from Figure 5.6 that for kaolin 6% the excess pressure gradient was about 15% more than that in the 20% sand case. Kaolin 15% was similar to the 20% sand case and the excess pressure gradients increased by about 16%. Kaolin 10% resembled the constant trend of 15% kaolin up to 3.5 m/s after which it dropped off. It can be noted from Figure 5.4 to Figure 5.6 that the concentration of solid particles did not change significantly the shape of the excess pressure gradient plot or the flow pattern, but can increase or reduce the pressure gradients depending on whether it is increased or reduced.

5.2.2 Effect of the size of coarse particles

Referring again to Figure 5.4 to Figure 5.6, the present section shows the effect of coarse particle size at various sand concentrations.

10% sand concentration

In 15% kaolin there was no difference between the two sand sizes over the entire range of velocities. The reason for this is that solid particles were fully suspended and the sand concentration was low, meaning lesser intergranular collisions. This means that the behaviour of the two sand sizes was almost the same in this instance. In their analysis of experimental results obtained by other researchers on flow of sand in water, Lu, Yin, Yuan & Wang (2010) pointed out the effect of floating against gravity which prevents the coarse particles from settling down and results in a less friction. Their conclusion showed the benefit of suspended particles with regard to pressure drop. The results of the present work showed that 3 mm sand in 10% kaolin contributed 10% more to the pressure gradient than 1 mm sand over the entire range of velocities. This could indicate that relatively more of the 3 mm sand had settled down in 10% kaolin. In 6% kaolin the 3 mm sand contributed 5% more to the pressure gradient than 1 mm sand from the minimum velocity to 3.5 m/s. Then the contribution of 3 mm sand dropped off to almost 0% at 4.5 m/s. The 1 mm sand levelled off by 5 m/s. This showed that at low and moderate velocities all the sand sizes (1 and 3 mm) had settled down in 6% kaolin carrier.

20% sand concentration

For 6 and 10% kaolin carriers, there was no significant difference from the 10% sand case. For 15% kaolin, the effect of particle size was evident. The 1 mm sand gave a higher excess pressure gradient (74% of the carrier only pressure gradients) than the 3 mm sand (34%). Once again the reason for this was the interparticle collisions (refer to Section 5.1).

30% sand concentration

Trends were the same as those of the 20% sand case for all kaolin concentrations.
From the results of tests using all the three sand concentrations (10, 20 and 30% by volume) it could be noted that the particle size affects the flow patterns, thus the pressure drop. A similar conclusion was reached by other researchers, e.g. Lu *et al*. (2010) and Chhabra & Richardson (2008). However, in the context of the present study and in relation to pressure gradients, it could be deduced from the comparison of the two sand sizes (1 and 3 mm) that the small sand size was beneficial when not fully suspended, otherwise interparticles collisions may induce higher pressure drops as shown by Wilson (2004).

5.2.3 Effect of carrier fluid concentration

Figure 5.7 to Figure 5.9 depict the profiles of excess pressure gradient regrouped by carrier fluid concentration.

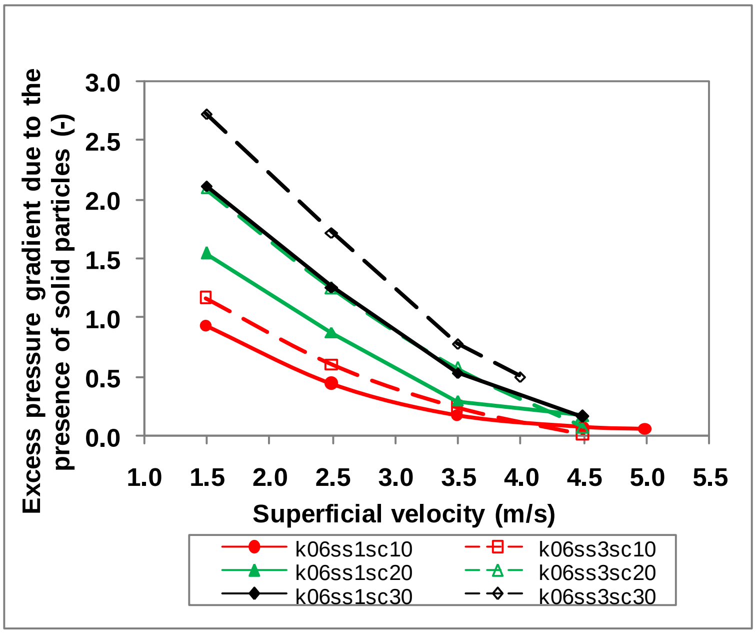


Figure 5.7: Effect of sand in all mixtures based on 6% kaolin carrier

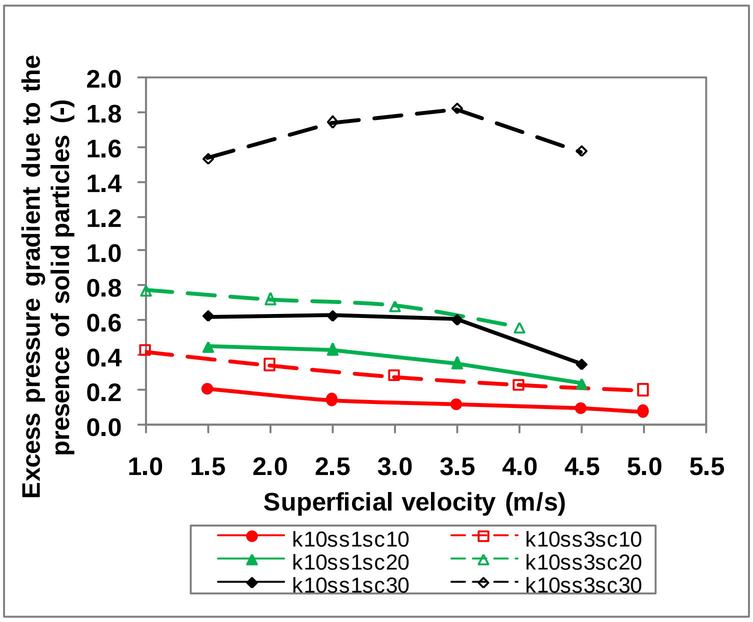


Figure 5.8: Effect of sand in all mixtures based on 10% kaolin carrier

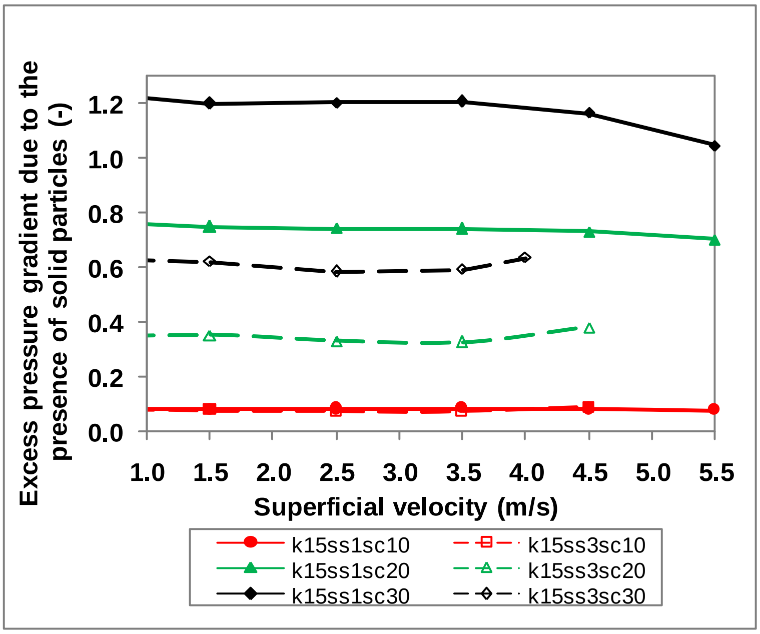


Figure 5.9: Effect of sand in all mixtures based on 15% kaolin carrier

From Figure 5.7 to Figure 5.9, the following observations were made concerning the impact of the concentration of carrier fluids:

- For low concentration carrier fluids there was an essentially linear decrease in the excess pressure gradients for all sand concentrations (10 to 30%). The excess pressure gradient due to 3 mm coarse particles was 5% higher than that of 1 mm particles until 4 m/s where the two profiles crossed over, independent of the sand concentration. A 10% increase in the volumetric concentration of the coarse particles resulted in a 40% increase in the excess pressure gradients.
- For high concentration carrier fluids the excess pressure gradients remained almost constant over the entire velocity range. The excess pressure drop was dependent on the concentration and size of the coarse particles. At low coarse particle concentration (10%) the excess pressure drop was independent of the sand size. However, when the sand concentration was increased to 20 and 30% the excess pressure drop due to 1 mm sand was much higher than that of 3 mm sand. Excess pressure drop due to 3 mm sand increased linearly from 7.5% at 10% to 60% at 30% sand. For 3 mm sand the excess pressure drop was less sensitive to an increase in sand concentration.
- For medium concentration (10%) carrier fluids with low concentrations of sand (10%), the excess pressure drop decreased linearly with velocity over the entire range of velocity tested. At higher sand concentrations the excess pressure drop tended toward a constant value until 3.5 m/s after which it dropped off. The 3 mm coarse particle contribution was 20% higher than 1 mm particles for 10 and 20% sand concentration.

When the sand concentration was increased to 30% the excess pressure gradients was approximatively 2.5 times that of the kaolin carrier fluid only for the 3 mm sand.

- The three graphs altogether showed that the concentration of the carrier fluid could completely change the flow patterns of solid particles. Excess pressure gradients induced by the presence of solid particles decreased as the concentration of the carrier fluid increased.

These findings were consistent with the observations made in Sections 5.2.1 and 5.2.2.

Validation of excess pressure gradients results

For the purpose of validating excess pressure gradients results, Vlasak *et al*. (2002) results have been replotted and displayed in Figure 2.11. These results were obtained for 23% volumetric concentration of respectively 1.4; 0.7 and 0.2 mm sand sizes pumped in water. They indicated a clear difference between fine (0.2 mm) and coarser (0.7 and 1.4 mm) sand. As could be expected in the case of water (Figure 2.11) or low concentration carrier fluid (Figure 5.7), the excess pressure gradients due to the presence of solid particles was severely high at lower velocities and decreases steeply and tended to flatten out as the velocity increased. The effect of coarser particles was much higher than that of finer particles. Vlasak *et al*. (2002) results corroborated the trends observed in the present study for coarse sand.

5.3 Comparison of ERT results with pressure gradient plots

The objective of this work was to visualise the concentration profiles using ERT and to evaluate the effect of carrier concentration, particle concentration and particle size on the bed behaviour.

5.3.1 Effect of carrier concentration, particle size and particle concentration on flow pattern

It could be noted from Figure 4.5 to Figure 4.22 that near the bottom of the pipe, the concentration profiles for the tested sands bended backward, a feature that had been observed by other researchers for heterogeneous slurries and could be associated with an "off the wall" hydrodynamic lift that drives solid particles away from a boundary (Wilson, 2004). Examination of the ERT concentration profiles (combined with pipe cross-sectional images) displayed in Figure 4.5 to Figure 4.22 enabled the compilation of Table 5.1 which summarised flow patterns indicated by ERT measurements for all the mixtures at 3 different velocities (1.5, 2.5 and 4 m/s). As a criterion used in differentiating flow patterns, an almost vertical line concentration profile (or a uniformly distributed concentration) was an indication of a pseudohomogeneous flow while a sudden increase in the "concentration" was used to distinguish between bed type flows (Pachowko *et al*., 2003). In this table the type of flow pattern was determined from the comparison of the concentration profile under consideration and the theoretical concentration profiles defined for each flow pattern in Figure 2.6. Since the lowest test speed in the present work was always just above that at which the bed became stationary the expression “layered flow” in the table under consideration refers to the moving bed flow.

Table 5.1: Flow patterns derived from ERT results for all the tested mixtures

Mixture	**Velocity (m/s)**		
	1.5	**2.5**	**4**
k6ss1sc10	Layered flow	Layered flow	Heterog./homog. flow
k10ss1sc10	Layered flow	Layered/heterog. flow	Homogeneous flow
k15ss1sc10	Heterog./homog. flow	Heterog./homog. flow	Heterog./homog. flow
k6ss3sc10	Layered flow	Layered flow	Layered flow
k10ss3sc10	Layered flow	Heterog./homog. flow	Homogeneous flow
k15ss3sc10	Layered/heterog. flow	Layered/heterog. flow	Layered/heterog. flow
k6ss1sc20	Layered flow	Layered flow	Heterogeneous flow
k10ss1sc20	Layered flow	Layered flow	Layered flow
k15ss1sc20	Heterog./homog. flow	Heterog./homog. flow	Homogeneous flow
k6ss3sc20	Layered flow	Layered flow	Layered/heterog. flow
k10ss3sc20	Layered flow	Layered flow	Heterogeneous flow
k15ss3sc20	Layered/heterog. flow	Layered/heterog. flow	Homogeneous flow
k6ss1sc30	Layered flow	Layered flow	Heterogeneous flow
k10ss1sc30	Layered flow	Layered flow	Layered/heterog. flow
k15ss1sc30	Homogeneous flow	Homogeneous flow	Homogeneous flow
k6ss3sc30	Layered flow	Layered flow	Layered/heterog. flow
k10ss3sc30	Layered flow	Layered/heterog. flow	Layered/heterog. flow
k15ss3sc30	Layered/heterog. flow	Layered/heterog. flow	Heterogeneous flow

The following observations were made concerning Table 5.1:

At low velocities (1.5 m/s)

For the same sand size and same sand concentration the flow patterns changed from layered to heterogeneous flow or from layered to homogeneous flow as the concentration of kaolin carrier increased from 10 to 15% for I mm sand size. The increase from 6 to 10% kaolin carrier did not induce any change in flow patterns, the flow being layered for all the sand concentrations and sand sizes.

For 3 mm sand size the flow was layered regardless of the sand concentration and carrier concentration. This was true for 6 and 10% kaolin. For 15% kaolin a clear distinction could not be made between layered and heterogeneous flow appearances. The particle size affected the flow pattern changing it from one type to another only at high carrier concentration (15%) where the flow changed from heterogeneous/homogeneous to layered/heterogeneous and from homogeneous to layered/heterogeneous flow as the sand size increased from 1 to 3 mm. The concentration of sand particles did not practically affect the flow patterns.

At moderate velocities (2.5 m/s)

At moderate (20%) and high (30%) sand concentration the effect of carrier concentration on flow patterns was as in the case of low velocities. At low solids concentration (10%) the flow pattern change was observed even when the carrier concentration increased from 6 to 10%.
The particle size affected the flow patterns at high carrier concentration (15%) where the carrier fluid could not fully maintain 3 mm sand size in suspension while 1 mm sand could be suspended. The concentration of particles did not influence the flow patterns.

At high velocities (4 m/s)

The concentration of carrier fluid affected the flow pattern for the whole range of tested carrier concentrations. Layered flows were observed but for low carrier fluid concentrations and 3 mm sand size. The particle size affected the flow patterns over the range of tested mixtures. Bigger particles (3 mm) had the tendency to settle.

For the same carrier concentration and same sand size the “degree of segregation” between solids and carrier fluid decreased as the concentration of solid particles increased from 10 to 20 and from 20 to 30%. This phenomenon could be due to more solids collisions in the mixture leading to more solid particles being suspended (Wilson, 2004).

5.3.2 Identification of change over from laminar two-layer to heterogeneous laminar flow

Table 5.2 compares the change over velocity from laminar two-layer to heterogeneous laminar flow as deduced from ERT results with that provided by the pressure gradient profiles. The transition velocities obtained from the pressure gradient vs. velocity profiles in Figure 4.5 to Figure 4.22 were determined as minimums of the graphs while those derived from ERT measurements were obtained by examination of the concentration profile as in Section 5.3.1. Table 5.2 indicated that ERT results (images and concentration profiles) and pressure gradients plots revealed practically the same transition velocity from layered to heterogeneous flow pattern. No layered flow pattern was detected for 1 mm sand size and at high kaolin carrier concentration (15%). This was an indication of a pseudohomogeneous flow pattern and was in harmony with the observations reported in Table 5.1.

Table 5.2: Transition velocities derived from ERT results and pressure gradients vs. velocity graphs for all the tested mixtures

Carrier/sand size/ sand concentration	Transition velocity obtained from press. grad. vs. velocity graphs	Transition velocity obtained from ERT results
k06ss1sc10	Layered flow until 2.8 m/s	Above 2.8 m/s, heterog. flow. Below, layered flow.
k06ss1sc20	Layered flow until 2.8 m/s	2.8 m/s
k06ss1sc30	Layered flow until 3.1 m/s	3.4 m/s. Hard to see from images. Concentration profiles were used
k06ss3sc10	2.7 m/s	2.7 m/s
k06ss3sc20	2.9 m/s	2.9 m/s. Hard to distinguish from concentration profiles. Images were used.
k06ss3sc30	3.1 m/s	3.4 m/s. Hard to see from concent. profiles.
k10ss1sc10	2 m/s	2 m/s
k10ss1sc20	2.4 m/s	2.4 m/s. Hard to distinguish from concentration profiles.
k10ss1sc30	2.6 m/s	2.8 m/s. Hard to distinguish from concentration profiles
k10ss3sc10	2.6 m/s	2 m/s
k10ss3sc20	2.7 m/s	2.7 m/s
k10ss3sc30	2.7 m/s	2.7 m/s
k15ss1sc10	No layered flow	No layered flow
k15ss1sc20	No layered flow	No layered flow
k15ss1sc30	No layered flow	No layered flow
k15ss3sc10	No layered flow	Hard to see from concentration profiles. Images show a very small bed at 0.4 m/s.
k15ss3sc20	No layered flow	Hard to see from concentration profiles. Images show a very small bed at 0.6 m/s.
k15ss3sc30	No layered flow	Hard to see from concentration profiles. Images show a very small bed at 0.6 m/s.

Table 5.2 showed also that for a given kaolin carrier concentration and a given sand size the transition velocity from laminar moving bed to laminar heterogeneous flow increased as the concentration of coarse solid particles increased. This was consistent with the general trends shown in Peker & Helvaci (2008).

5.4 Conclusion

Results obtained from the pipe test rig for the flow of coarse particles in non-Newtonian carrier fluid were evaluated and discussed in this chapter. The general trend of the pressure gradients vs. velocity graphs was that increasing the slurry solids concentration increased the pressure gradients or friction losses. However, the curves were different for different solids sizes with the profile of the smaller solids size (1 mm) being below that of the bigger size (3 mm) except for the case of medium and high solids concentrations (20 and 30%) in 15% kaolin carrier concentration where the pressure gradient profile of 1 mm sand was above that of 3 mm sand size. This could be due to interparticles collisions (Wilson, 2004). It was observed from the pressure gradients vs. velocity profiles that for the same sand concentration and same superficial velocity, as far as the kaolin carrier fluid concentration increased the total pressure gradients of the sand mixture increased as well.

It was also noted that for low kaolin carrier fluids (6%) there was a linear or steep decrease in the excess pressure gradients with increasing velocity for all sand concentrations. The excessive pressure gradient at low velocity was an indication of accumulation of solid particles at the bottom of the pipe. For high kaolin carrier concentration (15%), the excess pressure gradient was constant over the entire velocity range. This signified a pseudohomogeneous flow pattern. For medium kaolin carrier concentration (10%) and high sand concentrations the excess pressure gradient tended toward a constant value after which it dropped off while at low sand concentration it decreased linearly with velocity.

The comparison of the ERT results with pressure gradient profiles as to the identification of the transition velocity between laminar two-layer and heterogeneous laminar flows showed that the two techniques lead to similar values of transition velocity. As the kaolin carrier concentration increased or as the sand concentration increased it became more difficult to distinguish the transition velocity between heterogeneous and layered flow.

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Chapter 6 Conclusions and recommendations

This project was concerned with the identification of flow patterns of two-phase liquid-solid flow using pressure gradients vs. velocity plots and ERT results as techniques. Complete results from Φ56 mm pipe were displayed (for 1 and 3 mm sand sizes) and the results of the two methods were compared. The pressure gradient profiles were used to check and verify ERT results. Since the transition velocity between stationary bed and moving bed or moving bed and heterogeneous flow regime is of major concern for design purposes and safe operation conditions of pipelines, the identification of the change over velocity between layered and heterogeneous flows using the two methods was done and results were compared.

Results of pressure drop measurements of sand-kaolin slurries were presented as plots of pressure gradients vs. superficial velocities. For a given mixture, this graph was presented beside a graph of "concentration" profile and ERT images. Relative excess pressure gradients vs. superficial velocities graphs were also drawn, analysed and discussed.

6.1 Conclusions

The following conclusions were drawn from the consideration of experimental results:

- For the same sand concentration and same superficial velocity, increasing the kaolin carrier concentration increases the total pressure gradients of the sand-kaolin mixture. However, carrier fluid concentration affects flow patterns, changing them from layered to pseudohomogeneous flows as it increases.
- The sand concentration affects pressure gradients and not the type of flow. For the range of solid particles tested here, the sand size does not change flow pattern from one type to another but could increase or lower the pressure gradient depending on the case. The exception to this could be observed at higher velocities where the smaller size was ''fully'' suspended.
- Excess pressure gradients due to the presence of solids are relatively higher at low flow rates and low carrier concentration and decrease steeply as the velocity increases. This implies the existence of a contact load or a bed. At medium carrier concentration, the profiles tend to flatten out as the velocity increases while at high carrier concentration the excess pressure gradient is constant over the entire range of tested velocities.
- ERT results compare well to pressure gradients profiles in detecting flow pattern. The transition velocities from layered to heterogeneous flow obtained from both methods were similar, especially for low and moderate carrier concentrations. However, much work is still needed to improve the instrument and its computer program.

6.2 Recommendations

Upon completion of the present work, the following suggestions were made to advance the two-phase liquid-solid flow field as far as flow patterns are concerned:

- The effect of solid particles distribution on flow patterns needs to be investigated since broad particle size distribution and mixed regime slurries are widely encountered in practice.
- The effect of interparticle collisions or solid particle size on pressure gradients in a pseudohomogeneous flow pattern or when the solid phase is suspended in a liquid needs to be investigated.
- An avenue of research is opened with the ERT instrument and its image reconstruction software. It needs to be updated and calibrated to derive absolute values of concentrations or concentration profiles. The knowledge of the concentration profile would be an interesting input to theoretical models for the evaluation of pressure drop of settling slurries.
- Further research is needed to clarify the distinction between the velocity at the limit of stationary deposit and the critical velocity using ERT technique.
- An attempt can be made to update the theoretical correlations for the prediction of transition velocities between different flow patterns by taking into account non-Newtonian carrier fluids. In view of that the viscosity and Reynolds number need to be appropriately modeled.

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Appendices

Appendix A. Pictures of the test loop

Figure A.1: Pipe test loop

Figure A.1 shows a picture of the test rig, which consisted of Φ56 and 80 mm pipes.

Figure A.2: Connection between the pump and the pipe test rig

Valve for Φ56 test loop (pipes)

Pump motor VSD

Valve for Φ56 test loop (pipes)

Appendix B. ERT program

The following main steps were followed to run the program (UCT ERT Installation Guide, 2006):

- Selecting a mesh and precomputed file
- Setting up the measurement sequence and testing serial comms.
- Setting the current level
- Calibration
- Start capturing
- Saving data (raw voltage measurements taken by the instrument)

Off-line processing of raw data was done to generate images, following these steps:

- Under "Hardware options" menu, select "Electrode layers" and the measurement sequence file
- Under "reconstruction options" menu, change mesh (836 elements mesh was used)
- Under "File" menu, load the appropriate calibration file and reconstruct a saved tomography data set (*. tom) and save the data to a conductivity file (*.con). At this stage, conductivity files (extension .con) are created from tomography files (extension .tom)
- Start Matlab R2007b
- Load the appropriate mesh file
- Load the appropriate conductivity file
- Click on "display image" to view the image and "Extract centre line". The last option creates a (*. csv) file which contains in fact data for concentration profile.

Figure B.1 displays the interface of ERT program as designed at the University of Cape Town. It has the following main menus that are used for processing a data set: File, Reconstruction options, hardware options and Help. The toolbar that is underneath the main menus is used for setting up the ERT instrument and capturing data.

The main menus provide different options, which if called, display a dialogue box enabling one to upload specific files where raw data were saved. Figures B.1 and B.2 illustrate dialogue boxes for uploading respectively measurement sequence file and mesh file.

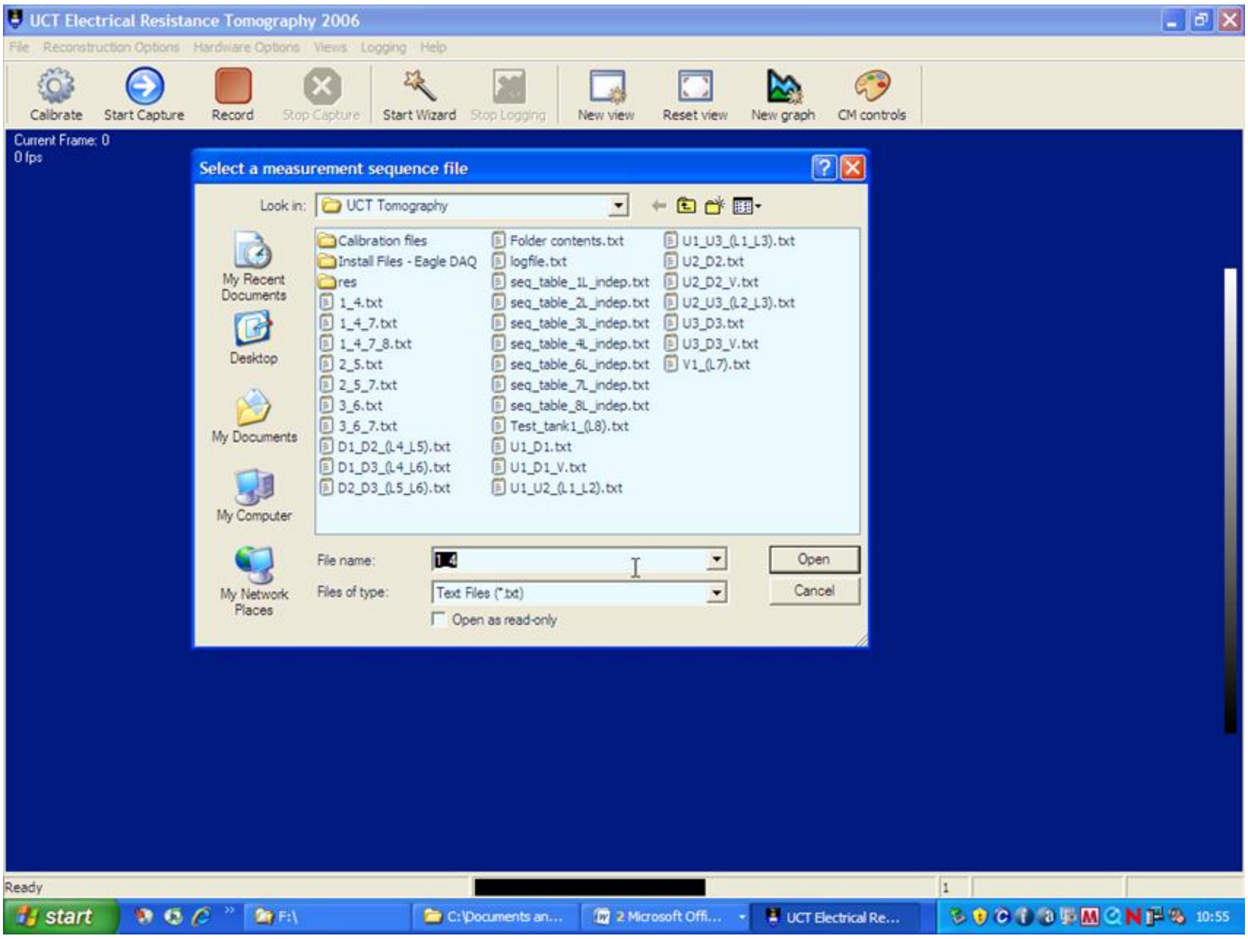

Figure B.1: Dialogue box for uploading measurement sequence file

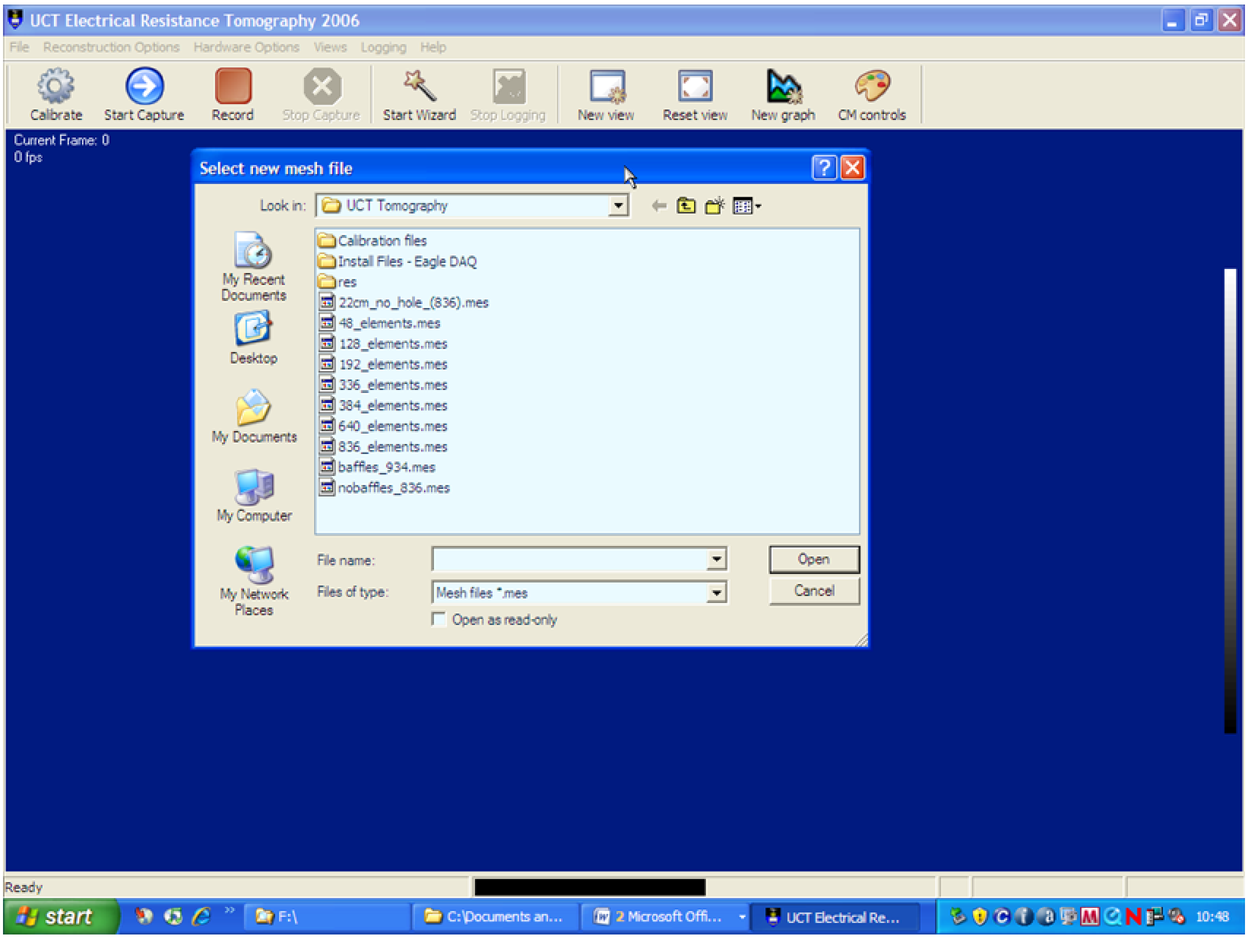

Figure B.2: Dialogue box for uploading mesh file

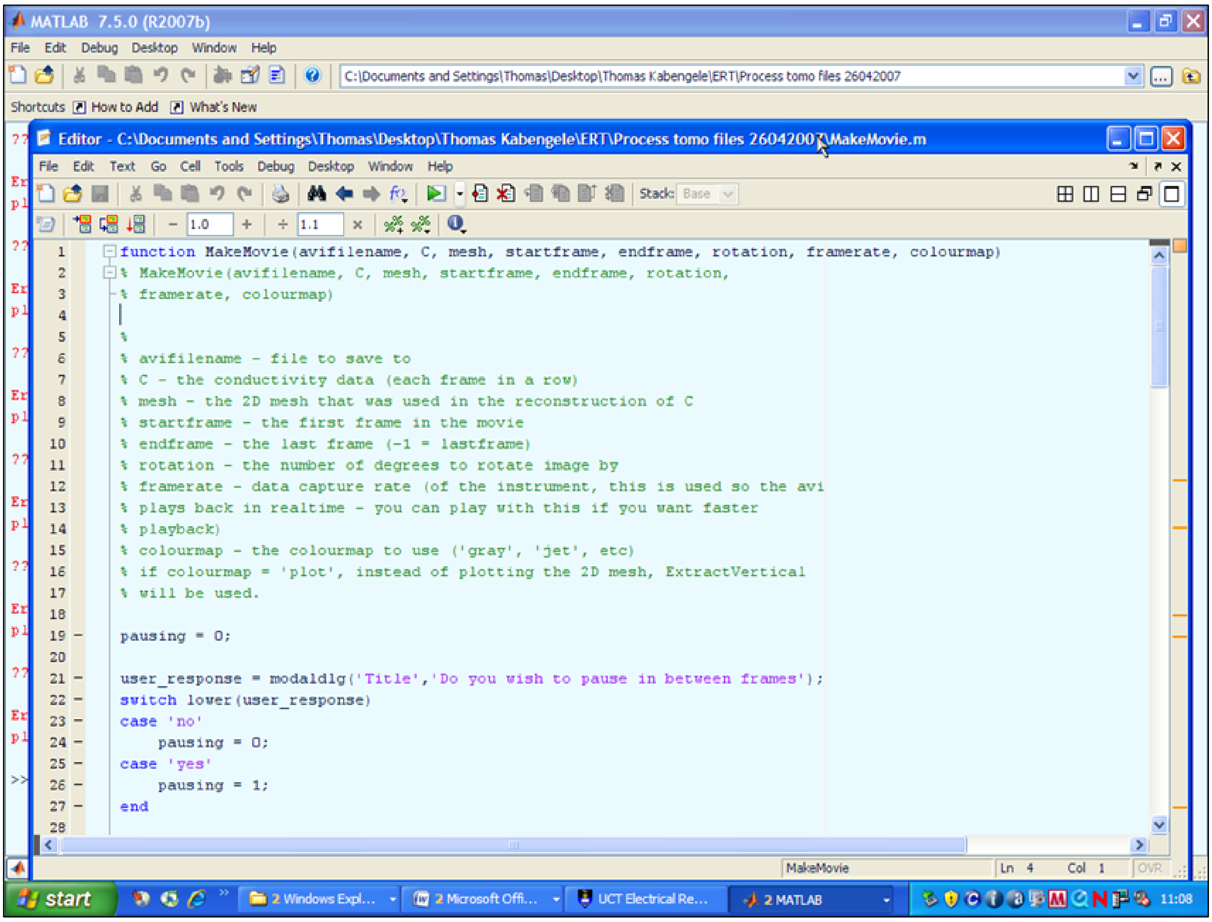

Figure B.3: Matlab interface used in the post-processing of ERT results

Appendix C. Raw data

Rheology data

d56_k06ss1sc00		Fit (model)		d56_k10ss1sc00		Fit (model)		d56_k15ss1sc00		Fit (model)	
8V/D(s^{-1})	τ_0(Pa)	8V/D(s^{-1})	τ_0(Pa)	8V/D(s^{-1})	τ_0(Pa)	8V/D(s^{-1})	τ_0(Pa)	8V/D(s^{-1})	τ_0(Pa)	8V/D(s^{-1})	τ_0(Pa)
31.988	9.085	35.929	9.085	20.410	23.242	21.482	23.242	27.087	65.957	14.889	65.957
31.988	8.934	29.197	8.934	20.410	22.773	15.205	22.773	27.087	65.630	13.634	65.630
66.496	9.814	78.392	9.814	55.331	25.174	62.354	25.174	48.041	71.047	43.871	71.047
66.496	9.652	67.545	9.652	55.331	25.016	58.065	25.016	48.041	71.142	44.594	71.142
83.773	9.766	75.094	9.766	65.066	25.822	81.955	25.822	57.571	73.013	60.317	73.013
83.773	9.720	72.018	9.720	65.066	25.096	60.222	25.096	57.571	73.390	63.833	73.390
92.560	10.015	93.035	10.015	98.254	26.554	107.864	26.554	82.530	75.044	80.648	75.044
92.560	9.880	83.042	9.880	98.254	26.233	95.976	26.233	82.530	76.855	101.767	76.855
121.380	10.594	141.723	10.594	105.569	26.915	122.129	26.915	84.611	75.353	84.049	75.353
121.380	10.426	126.564	10.426	105.569	26.293	98.144	26.293	84.611	75.367	84.206	75.367
126.181	10.349	119.960	10.349	156.166	27.898	166.204	27.898	88.528	77.351	108.043	77.351
126.181	10.228	109.757	10.228	156.166	27.522	148.470	27.522	88.528	77.807	114.024	77.807
166.747	11.192	202.014	11.192	160.591	28.166	179.573	28.166	111.160	79.315	135.118	79.315
166.747	11.041	185.920	11.041	160.591	27.479	146.500	27.479	111.160	79.687	140.642	79.687
172.456	10.844	165.751	10.844	204.893	28.759	211.192	28.759	120.344	78.276	120.362	78.276
172.456	10.713	152.968	10.713	204.893	28.358	189.524	28.358	120.344	77.837	114.417	77.837
216.965	11.262	209.726	11.262	209.076	28.835	215.454	28.835	154.003	82.924	194.156	82.924
216.965	11.155	197.998	11.155	209.076	28.259	184.351	28.259	154.003	83.136	197.997	83.136
217.452	11.280	211.785	11.280	247.347	29.480	253.522	29.480	164.163	82.127	180.056	82.127
217.452	11.217	204.756	11.217	247.347	28.788	212.832	28.788	164.163	82.266	182.482	82.266
260.660	11.543	241.976	11.543	249.709	29.518	255.838	29.518	165.679	82.271	182.554	82.271
260.660	11.568	244.950	11.568	249.709	29.075	229.233	29.075	165.679	82.681	189.789	82.681
269.807	11.706	261.665	11.706	282.158	29.918	281.257	29.918	168.580	81.546	170.172	81.546
269.807	11.673	257.542	11.673	282.158	29.389	247.924	29.389	168.580	81.136	163.378	81.136
273.562	11.887	284.266	11.887	285.238	30.641	330.625	30.641	224.109	84.059	215.269	84.059
273.562	11.877	282.935	11.877	285.238	29.603	261.126	29.603	224.109	84.105	216.151	84.105
				300.894	29.976	285.076	29.976	226.646	85.356	240.917	85.356
				300.894	29.644	263.727	29.644	226.646	86.012	254.525	86.012
				329.962	30.620	329.164	30.620	260.525	86.515	265.228	86.515
				329.962	30.165	297.643	30.165	260.525	86.776	270.896	86.776
				403.825	31.512	395.947	31.512	266.006	88.252	304.156	88.252
				403.825	31.294	379.033	31.294	266.006	88.397	307.527	88.397

Kaolin-sand mixtures data

Carrier k06

Mixture d56_k06ss1sc10

10% 1mm

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
5.0	5.0	1282.2	23.8	11.5	3872.9	3856.3
4.4	4.4	1280.1	23.5	11.4	3106.6	3110.5
3.9	3.9	1279.8	23.5	11.3	2468.1	2475.8
3.3	3.3	1279.5	23.4	11.3	1962.3	2012.2
2.6	2.6	1279.9	23.5	11.3	1584.4	1648.2
2.1	2.1	1277.7	23.2	11.2	1523.1	1504.2
1.9	1.9	1265.0	21.7	10.4	1442.2	1444.8
1.5	1.5	1265.9	21.9	10.4	1413.8	1378.1
2.4	2.4	1280.5	23.6	11.4	1526.1	1599.0
2.9	2.9	1280.6	23.6	11.4	1734.9	1792.2

Carrier k06

Mixture k06ss1sc20

20%

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.1	4.1	1398.1	36.0	19.0	2942.0	3017.1
3.9	3.9	1397.9	36.0	19.0	2620.2	2744.2
3.6	3.6	1396.4	35.9	18.9	2352.9	2527.1
3.2	3.2	1395.4	35.8	18.8	2252.8	2321.8
2.8	2.8	1395.1	35.7	18.8	2161.4	2157.3
2.4	2.4	1395.9	35.8	18.9	2005.8	2005.0
2.1	2.1	1394.2	35.6	18.8	1942.8	1939.5
1.6	1.6	1389.5	35.2	18.5	1947.5	1953.8

Carrier k06

Mixture k06ss1sc30

30%

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.2	4.2	1508.6	46.0	26.2	3230.3	3399.0
4.0	4.0	1507.7	45.9	26.1	3037.6	3221.7
3.7	3.7	1507.3	45.9	26.1	2867.5	3053.6
3.4	3.4	1505.4	45.7	26.0	2749.5	2875.2
3.1	3.1	1504.8	45.7	25.9	2684.9	2708.3
2.8	2.8	1502.1	45.5	25.8	2512.6	2584.3
2.4	2.4	1499.9	45.3	25.6	2421.7	2439.2
1.7	1.7	1502.6	45.5	25.8	2348.1	2469.5
2.0	2.0	1510.8	46.2	26.3	2369.4	2408.3

Mixture d56_k06ss3sc10

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.5	4.5	1270.0	23.2	11.1	3051.6	3051.1
4.2	4.2	1271.3	23.3	11.2	2754.6	2764.2
3.6	3.6	1272.3	23.4	11.2	2486.8	2507.9
3.6	3.6	1272.7	23.5	11.3	2241.5	2277.1
3.2	3.2	1274.2	23.6	11.4	2043.6	2076.1
3.1	3.1	1274.2	23.6	11.4	1960.5	1990.5
2.7	2.7	1272.3	23.4	11.2	1764.9	1798.8
1.5	1.5	1249.1	20.7	9.8	1581.1	1588.7
2.1	2.1	1263.8	22.4	10.7	1603.3	1607.8
3.8	3.8	1265.5	22.6	10.8	2474.7	2491.0

Carrier k06

Mixture d56_k06ss3sc20

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
3.6	3.6	1422.6	38.9	20.9	2808.5	2795.3
2.9	2.9	1421.6	38.8	20.8	2572.2	2632.5
2.6	2.6	1423.0	38.9	20.9	2450.8	2486.1
2.3	2.3	1425.1	39.1	21.0	2368.5	2364.5
1.8	1.8	1426.4	39.2	21.1	2195.5	2208.5
1.3	1.3	1391.1	35.9	18.8	2320.6	2232.2
2.2	2.2	1430.5	39.6	21.4	2274.1	2280.2
3.3	3.3	1424.1	39.0	21.0	2661.8	2750.3
3.8	3.8	1421.1	38.7	20.8	2992.9	3078.9

Carrier k06

Mixture k06ss3sc30

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
3.1	3.1	1521.5	47.8	27.4	3016.2	3179.3
3.4	3.4	1522.1	47.8	27.5	3111.9	3271.9
2.7	2.7	1535.0	48.8	28.3	2966.1	3096.4
2.5	2.5	1523.8	48.0	27.6	2855.0	2923.7
2.0	2.0	1525.6	48.1	27.7	2804.0	2842.2
1.8	1.8	1517.1	47.4	27.1	2772.8	2817.7
1.6	1.6	1528.0	48.3	27.8	2752.7	2798.9
3.9	3.9	1520.1	47.7	27.3	3417.5	3488.7

Carrier k10

Mixture d56_k10ss1sc10

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
6.0	6.0	1327.7	23.0	11.5	5602.0	5573.0
5.2	5.2	1327.1	22.9	11.5	4304.3	4240.3
4.7	4.7	1323.9	22.6	11.3	3757.8	3666.4
4.2	4.2	1323.9	22.6	11.3	3212.2	3167.8
3.9	3.9	1323.6	22.5	11.2	2982.9	2962.0
3.6	3.6	1324.8	22.7	11.3	2800.2	2784.9
3.3	3.3	1324.0	22.6	11.3	2673.1	2678.3
2.9	2.9	1322.5	22.4	11.2	2609.9	2598.6
2.5	2.5	1326.1	22.8	11.4	2487.9	2514.1
2.0	2.0	1329.6	23.2	11.6	2476.6	2415.4
1.2	1.2	1340.8	24.5	12.4	2434.9	2570.9
1.2	1.2	1348.1	25.3	12.9	2469.5	2595.4
1.7	1.7	1341.0	24.5	12.4	2465.3	2531.1
6.0	6.0	1317.8	21.8	10.9	5737.9	5669.4
5.1	5.1	1318.7	21.9	10.9	4400.1	4326.4
4.1	4.1	1317.3	21.8	10.8	3274.6	3228.1
3.6	3.6	1316.9	21.7	10.8	2828.8	2825.3
3.2	3.2	1317.1	21.8	10.8	2684.9	2720.8
2.9	2.9	1318.5	21.9	10.9	2590.5	2629.1
2.5	2.5	1318.3	21.9	10.9	2487.1	2528.1
2.0	2.0	1319.5	22.0	11.0	2491.1	2422.1

Carrier k10

Mixture d56_k10ss1sc20

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.7	4.7	1438.8	34.9	19.0	4129.1	4149.7
3.6	3.6	1437.0	34.7	18.8	3391.2	3384.0
2.9	2.9	1440.5	35.1	19.1	3247.6	3200.5
2.4	2.4	1449.1	35.9	19.6	3092.6	3101.5
2.0	2.0	1456.0	36.6	20.1	3014.2	3140.7
1.6	1.6	1458.9	36.9	20.3	2972.2	3163.8
1.5	1.5	1475.0	38.4	21.4	2966.2	3172.2

Carrier k10

Mixture d56_k10ss1sc30

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.7	4.7	1542.4	44.4	25.8	4329.5	4354.6
3.5	3.5	1539.5	44.2	25.7	3970.8	3868.6
2.9	2.9	1538.2	44.0	25.6	3707.0	3644.3
2.4	2.4	1546.1	44.7	26.1	3543.2	3542.2
2.1	2.1	1574.8	47.1	28.0	3399.0	3551.0
1.7	1.7	1584.8	48.0	28.7	3326.6	3487.2
1.4	1.4	1587.7	48.2	28.9	3299.3	3454.8
3.6	3.6	1546.3	44.7	26.1	4091.7	3993.7

Carrier k10

Mixture d56_k10ss3sc10

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
1.0	1.0	1324.1	22.0	11.0	2815.3	2802.8
1.5	1.5	1335.4	23.3	11.8	2836.8	2902.1
1.6	1.6	1332.2	23.0	11.5	2817.0	2891.6
2.0	2.0	1327.3	22.5	11.3	2803.2	2871.5
2.1	2.1	1325.5	22.2	11.1	2796.6	2836.9
2.3	2.3	1318.4	21.4	10.7	2817.7	2837.8
2.4	2.4	1321.5	21.7	10.8	2817.6	2796.3
2.6	2.6	1317.9	21.3	10.6	2870.7	2824.5
2.6	2.6	1317.3	21.2	10.5	2877.9	2832.7
2.7	2.7	1315.7	21.0	10.4	2869.4	2824.7
2.9	2.9	1311.7	20.5	10.2	2931.0	2935.1
3.0	3.0	1311.0	20.4	10.1	2925.6	2931.3
3.0	3.0	1311.5	20.5	10.1	2931.8	2932.7
3.3	3.3	1307.9	20.1	9.9	3003.0	3044.4
3.6	3.6	1312.8	20.7	10.3	3120.7	3203.6
3.8	3.8	1312.9	20.7	10.2	3204.6	3318.4
3.9	3.9	1312.1	20.6	10.2	3200.7	3316.8
4.0	4.0	1313.9	20.9	10.3	3250.6	3394.8
4.2	4.2	1314.0	20.9	10.4	3446.2	3584.6
4.6	4.6	1316.9	21.2	10.5	3876.0	3916.8
4.7	4.7	1316.9	21.2	10.5	3854.1	3914.3
4.9	4.9	1314.8	20.9	10.4	4298.0	4351.2
5.0	5.0	1314.4	20.9	10.3	4305.3	4350.6

Carrier k10

Mixture d56_k10ss3sc20

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.3	4.3	1452.6	35.9	19.7	4376.0	4599.8
3.6	3.6	1451.2	35.7	19.6	4069.4	4081.4
3.1	3.1	1463.5	36.9	20.4	3869.0	3859.1
2.7	2.7	1472.1	37.7	21.0	3737.2	3778.7
2.2	2.2	1487.7	39.2	22.0	3601.9	3775.5
1.6	1.6	1471.2	37.7	20.9	3608.5	3723.3
0.9	0.9	1462.6	36.8	20.3	3474.6	3474.8
5.3	5.3	1455.9	36.2	19.9	5342.6	5485.3

Carrier k10

Mixture d56_k10ss3sc30

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.9	4.9	1555.9	45.3	26.6	5567.5	5748.4
4.2	4.2	1551.3	44.9	26.3	5132.5	5121.0
3.1	3.1	1562.4	45.8	27.0	4611.3	4761.3
2.1	2.1	1589.3	48.1	28.8	4357.5	4586.8
1.5	1.5	1612.8	50.0	30.4	4285.8	4454.7
2.7	2.7	1617.2	50.3	30.7	4479.2	4731.0

Carrier k15

Mixture d56_k15ss1sc10

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
5.0	5.0	1426.1	23.8	12.8	7626.0	7827.4
4.3	4.3	1424.4	23.6	12.7	7456.4	7600.2
3.5	3.5	1424.1	23.5	12.7	7238.2	7317.5
1.9	1.9	1428.1	24.0	12.9	6701.8	6611.6
2.9	2.9	1411.4	22.1	11.7	7109.7	7122.7
1.2	1.2	1415.6	22.6	12.0	6341.8	6280.8
0.6	0.6	1410.1	21.9	11.7	5923.9	5977.1
0.5	0.5	1408.2	21.7	11.5	5642.7	5783.7
0.4	0.4	1405.7	21.4	11.3	5587.7	5761.6

Carrier k15

Mixture k15ss1sc20

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
5.2	5.2	1538.0	36.1	21.0	12235.0	12322.5
4.3	4.3	1538.2	36.1	21.0	11940.3	12002.0
3.4	3.4	1524.6	34.8	20.0	11623.1	11525.0
2.7	2.7	1535.3	35.8	20.8	11298.9	11070.5
1.7	1.7	1566.0	38.8	22.9	10734.3	10681.0
1.0	1.0	1547.4	37.0	21.6	10054.7	10005.3
0.7	0.7	1533.6	35.7	20.6	9755.1	9757.0
0.5	0.5	1528.1	35.1	20.2	9308.9	9358.3

Carrier k15

Mixture k15ss1sc30

V_{upleg} (m/s)	$V_{downleg}$ (m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.7	4.7	1645.6	45.8	28.5	14874.4	15079.9
4.2	4.2	1635.4	44.9	27.7	15244.1	15153.2
3.8	3.8	1632.4	44.7	27.5	14753.1	14638.4
3.2	3.2	1638.6	45.2	28.0	14516.4	14383.0
2.5	2.5	1644.3	45.7	28.4	14317.8	13973.5
2.0	2.0	1665.4	47.5	29.9	13761.7	13554.7
1.1	1.1	1646.8	45.9	28.5	12813.4	12753.3
0.8	0.8	1642.2	45.5	28.2	12430.3	12395.2
0.5	0.5	1635.5	45.0	27.7	11835.4	11812.2

Carrier k15

Mixture k15ss3sc10

V_{upleg} (m/s)	$V_{downleg}$(m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.5	4.5	1390.6	21.2	11.1	8430.1	8483.2
3.7	3.7	1401.7	22.5	11.9	8143.6	8153.4
2.7	2.7	1359.6	17.4	8.9	7802.7	7717.6
1.9	1.9	1422.8	24.9	13.4	7487.3	7437.1
1.2	1.2	1413.4	23.9	12.7	7204.9	7140.4
0.6	0.6	1403.9	22.8	12.1	6569.0	6626.6
0.4	0.4	1406.1	23.0	12.2	6453.2	6510.5

Carrier k15

Mixture k15ss3sc20

V_{upleg} (m/s)	$V_{downleg}$(m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
4.2	4.2	1517.2	35.3	20.2	10409.9	10389.2
3.4	3.4	1473.7	30.8	17.1	9983.4	9979.1
2.5	2.5	1528.2	36.4	21.0	9600.5	9517.1
1.8	1.8	1572.6	40.6	24.1	9352.5	9252.4
1.0	1.0	1551.6	38.6	22.6	8851.9	8794.5
0.6	0.6	1532.7	36.8	21.3	8297.6	8364.8
0.5	0.5	1534.1	37.0	21.4	8135.3	8233.6

Carrier k15

Mixture k15ss3sc30

V_{upleg} (m/s)	$V_{downleg}$(m/s)	ρ_m (kg/m^3)	C_w (%)	C_v (%)	G_{upleg}	$G_{downleg}$
3.8	3.8	1595.0	42.7	25.7	12280.0	12330.8
2.8	2.8	1656.6	48.0	30.0	11562.2	11612.1
1.9	1.9	1705.0	51.9	33.4	11295.7	11274.4
1.3	1.3	1681.4	50.1	31.8	10903.8	10801.9
0.9	0.9	1668.9	49.0	30.9	10396.0	10421.9
0.5	0.5	1660.0	48.3	30.3	9922.8	10007.0

ERT data

d56_k06ss1sc10

-1		0.88542	0.35666	0.52876							
		Upleg velocity (m/s)									
Point no.	y/D	5.0	4.4	3.9	3.3	2.6	2.1	1.9	1.5	2.4	2.9
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.6931	0.7028	0.7162	0.6957	0.6390	0.4857	0.4573	0.3745	0.5931	0.6756
3	0.0000	0.6921	0.7018	0.7152	0.6945	0.6372	0.4827	0.4534	0.3702	0.5905	0.6740
4	0.0104	0.6908	0.7003	0.7136	0.6925	0.6344	0.4785	0.4479	0.3641	0.5865	0.6716
5	0.0208	0.6895	0.6989	0.7122	0.6905	0.6318	0.4745	0.4426	0.3584	0.5827	0.6693
6	0.0313	0.6884	0.6978	0.7109	0.6892	0.6305	0.4734	0.4410	0.3569	0.5813	0.6682
7	0.0417	0.6873	0.6966	0.7098	0.6882	0.6298	0.4733	0.4406	0.3568	0.5806	0.6674
8	0.0521	0.6862	0.6955	0.7086	0.6872	0.6290	0.4731	0.4402	0.3567	0.5800	0.6666
9	0.0625	0.6852	0.6944	0.7075	0.6861	0.6283	0.4729	0.4397	0.3567	0.5793	0.6658
10	0.0729	0.6848	0.6940	0.7071	0.6866	0.6303	0.4782	0.4461	0.3645	0.5831	0.6674
11	0.0833	0.6853	0.6945	0.7077	0.6886	0.6355	0.4894	0.4600	0.3812	0.5919	0.6714
12	0.0938	0.6857	0.6949	0.7082	0.6906	0.6407	0.5007	0.4739	0.3978	0.6006	0.6755
13	0.1042	0.6858	0.6949	0.7083	0.6917	0.6447	0.5104	0.4855	0.4121	0.6076	0.6785
14	0.1146	0.6855	0.6944	0.7075	0.6912	0.6471	0.5181	0.4939	0.4228	0.6116	0.6800
15	0.1250	0.6858	0.6946	0.7076	0.6918	0.6499	0.5253	0.5021	0.4328	0.6161	0.6821
16	0.1354	0.6866	0.6955	0.7084	0.6935	0.6538	0.5334	0.5120	0.4445	0.6223	0.6851
17	0.1458	0.6875	0.6963	0.7093	0.6953	0.6578	0.5416	0.5220	0.4563	0.6286	0.6883
18	0.1563	0.6884	0.6972	0.7102	0.6971	0.6616	0.5495	0.5316	0.4675	0.6346	0.6913
19	0.1667	0.6894	0.6982	0.7112	0.6990	0.6657	0.5577	0.5415	0.4790	0.6410	0.6945
20	0.1771	0.6903	0.6991	0.7121	0.7008	0.6696	0.5658	0.5513	0.4904	0.6472	0.6976
21	0.1875	0.6907	0.6995	0.7125	0.7018	0.6725	0.5722	0.5590	0.4997	0.6520	0.6998
22	0.1979	0.6907	0.6994	0.7123	0.7019	0.6737	0.5749	0.5623	0.5037	0.6540	0.7007
23	0.2083	0.6899	0.6984	0.7111	0.7005	0.6732	0.5757	0.5627	0.5046	0.6535	0.6999
24	0.2188	0.6890	0.6972	0.7095	0.6984	0.6723	0.5762	0.5624	0.5046	0.6525	0.6986
25	0.2292	0.6885	0.6966	0.7086	0.6975	0.6725	0.5781	0.5641	0.5068	0.6531	0.6985
26	0.2396	0.6871	0.6947	0.7062	0.6950	0.6726	0.5819	0.5672	0.5114	0.6536	0.6976
27	0.2500	0.6853	0.6924	0.7032	0.6919	0.6726	0.5862	0.5707	0.5167	0.6542	0.6966
28	0.2604	0.6820	0.6884	0.6981	0.6851	0.6675	0.5819	0.5630	0.5088	0.6471	0.6911
29	0.2708	0.6792	0.6850	0.6937	0.6791	0.6619	0.5753	0.5533	0.4980	0.6393	0.6855
30	0.2813	0.6790	0.6844	0.6925	0.6780	0.6632	0.5809	0.5580	0.5039	0.6411	0.6858
31	0.2917	0.6792	0.6842	0.6920	0.6785	0.6669	0.5906	0.5681	0.5167	0.6467	0.6882
32	0.3021	0.6807	0.6854	0.6930	0.6819	0.6747	0.6070	0.5870	0.5395	0.6583	0.6941
33	0.3125	0.6822	0.6866	0.6941	0.6853	0.6825	0.6236	0.6060	0.5625	0.6700	0.7001
34	0.3229	0.6837	0.6878	0.6951	0.6887	0.6902	0.6399	0.6248	0.5852	0.6815	0.7060
35	0.3333	0.6852	0.6891	0.6964	0.6920	0.6971	0.6542	0.6413	0.6049	0.6917	0.7113
36	0.3438	0.6873	0.6910	0.6981	0.6961	0.7054	0.6712	0.6606	0.6279	0.7038	0.7177
37	0.3542	0.6893	0.6927	0.6997	0.6992	0.7107	0.6820	0.6721	0.6416	0.7111	0.7219
38	0.3646	0.6916	0.6948	0.7018	0.7032	0.7174	0.6951	0.6868	0.6591	0.7204	0.7273
39	0.3750	0.6941	0.6971	0.7042	0.7081	0.7253	0.7103	0.7043	0.6799	0.7318	0.7338
40	0.3854	0.6953	0.6980	0.7050	0.7100	0.7288	0.7175	0.7123	0.6894	0.7368	0.7365
41	0.3958	0.6952	0.6978	0.7045	0.7097	0.7288	0.7181	0.7124	0.6896	0.7366	0.7363
42	0.4063	0.6957	0.6981	0.7048	0.7104	0.7300	0.7204	0.7148	0.6925	0.7382	0.7372
43	0.4167	0.6962	0.6985	0.7051	0.7112	0.7312	0.7227	0.7173	0.6953	0.7398	0.7382
44	0.4271	0.6957	0.6978	0.7042	0.7103	0.7296	0.7200	0.7139	0.6912	0.7376	0.7368
45	0.4375	0.6955	0.6973	0.7035	0.7094	0.7281	0.7173	0.7103	0.6869	0.7352	0.7355
46	0.4479	0.6957	0.6972	0.7031	0.7091	0.7274	0.7160	0.7083	0.6844	0.7339	0.7348

47	0.4583	0.6952	0.6964	0.7020	0.7078	0.7251	0.7116	0.7027	0.6776	0.7304	0.7327
48	0.4688	0.6956	0.6965	0.7019	0.7079	0.7246	0.7105	0.7010	0.6754	0.7294	0.7324
49	0.4792	0.6969	0.6977	0.7031	0.7095	0.7261	0.7125	0.7029	0.6775	0.7308	0.7338
50	0.4896	0.6973	0.6979	0.7032	0.7098	0.7259	0.7118	0.7018	0.6762	0.7303	0.7337
51	0.5000	0.6976	0.6980	0.7033	0.7100	0.7257	0.7111	0.7007	0.6748	0.7298	0.7336
52	0.5104	0.6988	0.6992	0.7046	0.7117	0.7275	0.7138	0.7038	0.6782	0.7320	0.7353
53	0.5208	0.6998	0.7001	0.7056	0.7130	0.7286	0.7152	0.7054	0.6801	0.7333	0.7365
54	0.5313	0.7008	0.7012	0.7068	0.7144	0.7301	0.7173	0.7077	0.6828	0.7351	0.7379
55	0.5417	0.7020	0.7025	0.7082	0.7161	0.7320	0.7201	0.7108	0.6864	0.7373	0.7397
56	0.5521	0.7032	0.7037	0.7096	0.7178	0.7338	0.7229	0.7139	0.6900	0.7396	0.7415
57	0.5625	0.7055	0.7061	0.7124	0.7211	0.7375	0.7283	0.7202	0.6974	0.7442	0.7450
58	0.5729	0.7078	0.7086	0.7152	0.7245	0.7411	0.7335	0.7263	0.7044	0.7487	0.7485
59	0.5833	0.7098	0.7107	0.7175	0.7274	0.7440	0.7375	0.7310	0.7098	0.7523	0.7514
60	0.5938	0.7121	0.7131	0.7202	0.7305	0.7472	0.7419	0.7361	0.7157	0.7562	0.7546
61	0.6042	0.7148	0.7159	0.7234	0.7341	0.7508	0.7468	0.7417	0.7220	0.7605	0.7582
62	0.6146	0.7163	0.7174	0.7252	0.7363	0.7527	0.7489	0.7444	0.7249	0.7628	0.7602
63	0.6250	0.7174	0.7186	0.7265	0.7380	0.7541	0.7504	0.7465	0.7271	0.7645	0.7617
64	0.6354	0.7192	0.7205	0.7286	0.7402	0.7565	0.7537	0.7503	0.7314	0.7674	0.7640
65	0.6458	0.7209	0.7223	0.7306	0.7425	0.7589	0.7571	0.7540	0.7358	0.7702	0.7663
66	0.6563	0.7231	0.7247	0.7332	0.7454	0.7618	0.7609	0.7583	0.7406	0.7736	0.7692
67	0.6667	0.7258	0.7276	0.7365	0.7489	0.7655	0.7658	0.7640	0.7471	0.7779	0.7727
68	0.6771	0.7270	0.7289	0.7379	0.7505	0.7670	0.7678	0.7664	0.7497	0.7798	0.7743
69	0.6875	0.7282	0.7301	0.7393	0.7522	0.7686	0.7697	0.7688	0.7524	0.7817	0.7759
70	0.6979	0.7293	0.7314	0.7407	0.7537	0.7701	0.7715	0.7710	0.7548	0.7835	0.7774
71	0.7083	0.7311	0.7332	0.7428	0.7562	0.7724	0.7744	0.7746	0.7587	0.7863	0.7798
72	0.7188	0.7328	0.7351	0.7449	0.7586	0.7747	0.7773	0.7783	0.7627	0.7892	0.7821
73	0.7292	0.7348	0.7372	0.7472	0.7611	0.7771	0.7801	0.7818	0.7665	0.7920	0.7845
74	0.7396	0.7371	0.7397	0.7500	0.7641	0.7800	0.7835	0.7859	0.7710	0.7953	0.7874
75	0.7500	0.7406	0.7434	0.7540	0.7684	0.7844	0.7890	0.7924	0.7782	0.8003	0.7917
76	0.7604	0.7441	0.7472	0.7581	0.7729	0.7889	0.7945	0.7989	0.7854	0.8054	0.7961
77	0.7708	0.7476	0.7510	0.7622	0.7773	0.7933	0.8001	0.8054	0.7926	0.8104	0.8004
78	0.7812	0.7526	0.7564	0.7680	0.7834	0.7992	0.8068	0.8133	0.8012	0.8169	0.8062
79	0.7917	0.7577	0.7618	0.7738	0.7895	0.8050	0.8132	0.8209	0.8094	0.8231	0.8120
80	0.8021	0.7628	0.7673	0.7797	0.7956	0.8108	0.8192	0.8280	0.8169	0.8292	0.8177
81	0.8125	0.7679	0.7728	0.7855	0.8017	0.8166	0.8251	0.8352	0.8245	0.8353	0.8234
82	0.8229	0.7715	0.7767	0.7896	0.8059	0.8208	0.8297	0.8404	0.8302	0.8396	0.8274
83	0.8333	0.7747	0.7802	0.7932	0.8096	0.8245	0.8338	0.8452	0.8354	0.8434	0.8309
84	0.8437	0.7788	0.7845	0.7978	0.8144	0.8291	0.8383	0.8508	0.8413	0.8481	0.8354
85	0.8542	0.7799	0.7857	0.7991	0.8158	0.8303	0.8395	0.8527	0.8431	0.8496	0.8367
86	0.8646	0.7810	0.7869	0.8004	0.8173	0.8316	0.8406	0.8545	0.8449	0.8510	0.8380
87	0.8750	0.7822	0.7883	0.8019	0.8189	0.8331	0.8419	0.8565	0.8470	0.8526	0.8395
88	0.8854	0.7841	0.7904	0.8041	0.8213	0.8353	0.8440	0.8595	0.8501	0.8550	0.8416
89	0.8958	0.7856	0.7921	0.8059	0.8233	0.8371	0.8457	0.8621	0.8527	0.8570	0.8434
90	0.9062	0.7876	0.7943	0.8083	0.8258	0.8395	0.8482	0.8654	0.8562	0.8595	0.8457
91	0.9167	0.7888	0.7956	0.8097	0.8274	0.8410	0.8497	0.8677	0.8587	0.8613	0.8472
92	0.9271	0.7897	0.7966	0.8108	0.8287	0.8423	0.8512	0.8702	0.8612	0.8629	0.8485
93	0.9375	0.7903	0.7973	0.8117	0.8298	0.8434	0.8523	0.8726	0.8637	0.8645	0.8496
94	0.9479	0.7908	0.7980	0.8125	0.8309	0.8445	0.8537	0.8754	0.8666	0.8662	0.8507
95	0.9583	0.7913	0.7987	0.8134	0.8321	0.8456	0.8550	0.8783	0.8695	0.8679	0.8518
96	0.9687	0.7919	0.7994	0.8143	0.8332	0.8467	0.8562	0.8809	0.8723	0.8696	0.8529
97	0.9792	0.7921	0.7997	0.8147	0.8338	0.8473	0.8570	0.8827	0.8741	0.8706	0.8535
98	0.9896	0.7921	0.7998	0.8149	0.8342	0.8477	0.8576	0.8841	0.8756	0.8714	0.8538
99	1.0000	0.7922	0.8000	0.8151	0.8345	0.8480	0.8583	0.8854	0.8770	0.8722	0.8542
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		0.88542	0.35666	0.52876							
		Upleg velocity (m/s). Normalised conductivities									
Point no.	y/D	5.0	4.4	3.9	3.3	2.6	2.1	1.9	1.5	2.4	2.9
1											
2		0.3636	0.3454	0.3200	0.3589	0.4661	0.7559	0.8097	0.9662	0.5529	0.3969
3	0.0000	0.3655	0.3474	0.3220	0.3611	0.4695	0.7617	0.8170	0.9744	0.5577	0.3999
4	0.0104	0.3681	0.3501	0.3249	0.3649	0.4748	0.7697	0.8275	0.9860	0.5653	0.4044
5	0.0208	0.3706	0.3527	0.3277	0.3686	0.4797	0.7771	0.8374	0.9968	0.5725	0.4087
6	0.0313	0.3727	0.3549	0.3300	0.3710	0.4821	0.7792	0.8404	0.9995	0.5752	0.4109
7	0.0417	0.3747	0.3570	0.3322	0.3730	0.4835	0.7795	0.8413	0.9997	0.5764	0.4123
8	0.0521	0.3767	0.3592	0.3344	0.3750	0.4849	0.7798	0.8421	0.9998	0.5777	0.4138
9	0.0625	0.3788	0.3613	0.3365	0.3769	0.4863	0.7801	0.8430	1.0000	0.5789	0.4153
10	0.0729	0.3794	0.3620	0.3372	0.3761	0.4824	0.7702	0.8309	0.9852	0.5717	0.4124
11	0.0833	0.3786	0.3611	0.3361	0.3723	0.4726	0.7489	0.8046	0.9536	0.5551	0.4047
12	0.0938	0.3777	0.3603	0.3351	0.3684	0.4628	0.7276	0.7783	0.9221	0.5386	0.3970
13	0.1042	0.3776	0.3603	0.3351	0.3663	0.4552	0.7092	0.7563	0.8952	0.5255	0.3913
14	0.1146	0.3782	0.3613	0.3366	0.3673	0.4507	0.6947	0.7404	0.8750	0.5178	0.3885
15	0.1250	0.3776	0.3608	0.3364	0.3661	0.4454	0.6811	0.7249	0.8560	0.5094	0.3846
16	0.1354	0.3760	0.3593	0.3348	0.3629	0.4380	0.6657	0.7062	0.8339	0.4976	0.3788
17	0.1458	0.3744	0.3577	0.3331	0.3596	0.4306	0.6503	0.6873	0.8116	0.4858	0.3729
18	0.1563	0.3727	0.3560	0.3314	0.3562	0.4233	0.6354	0.6692	0.7904	0.4743	0.3671
19	0.1667	0.3707	0.3541	0.3295	0.3526	0.4156	0.6199	0.6505	0.7687	0.4623	0.3611
20	0.1771	0.3690	0.3524	0.3278	0.3493	0.4082	0.6046	0.6320	0.7471	0.4506	0.3552
21	0.1875	0.3682	0.3517	0.3271	0.3474	0.4026	0.5924	0.6173	0.7295	0.4415	0.3510
22	0.1979	0.3683	0.3519	0.3274	0.3470	0.4004	0.5872	0.6111	0.7219	0.4377	0.3494
23	0.2083	0.3698	0.3537	0.3297	0.3498	0.4013	0.5857	0.6104	0.7202	0.4387	0.3509
24	0.2188	0.3715	0.3559	0.3327	0.3537	0.4030	0.5847	0.6110	0.7203	0.4405	0.3533
25	0.2292	0.3724	0.3571	0.3344	0.3554	0.4026	0.5812	0.6077	0.7161	0.4394	0.3536
26	0.2396	0.3751	0.3607	0.3390	0.3602	0.4025	0.5741	0.6019	0.7074	0.4384	0.3551
27	0.2500	0.3785	0.3650	0.3446	0.3660	0.4025	0.5658	0.5953	0.6973	0.4374	0.3571
28	0.2604	0.3847	0.3725	0.3543	0.3789	0.4122	0.5740	0.6097	0.7122	0.4507	0.3676
29	0.2708	0.3901	0.3790	0.3625	0.3903	0.4227	0.5865	0.6282	0.7328	0.4655	0.3782
30	0.2813	0.3903	0.3801	0.3648	0.3923	0.4204	0.5760	0.6193	0.7215	0.4621	0.3776
31	0.2917	0.3900	0.3806	0.3659	0.3913	0.4132	0.5576	0.6001	0.6974	0.4515	0.3730
32	0.3021	0.3872	0.3783	0.3639	0.3849	0.3986	0.5266	0.5644	0.6542	0.4296	0.3618
33	0.3125	0.3844	0.3760	0.3619	0.3784	0.3838	0.4953	0.5284	0.6108	0.4075	0.3505
34	0.3229	0.3816	0.3738	0.3599	0.3720	0.3692	0.4643	0.4928	0.5679	0.3856	0.3394
35	0.3333	0.3787	0.3713	0.3575	0.3659	0.3562	0.4374	0.4617	0.5305	0.3663	0.3294
36	0.3438	0.3746	0.3678	0.3543	0.3580	0.3405	0.4052	0.4251	0.4870	0.3434	0.3171
37	0.3542	0.3708	0.3645	0.3512	0.3521	0.3305	0.3848	0.4034	0.4611	0.3298	0.3092
38	0.3646	0.3665	0.3606	0.3473	0.3445	0.3178	0.3600	0.3757	0.4281	0.3120	0.2990
39	0.3750	0.3618	0.3561	0.3427	0.3354	0.3029	0.3312	0.3425	0.3888	0.2906	0.2868
40	0.3854	0.3597	0.3544	0.3412	0.3317	0.2962	0.3176	0.3274	0.3708	0.2811	0.2816
41	0.3958	0.3597	0.3549	0.3422	0.3324	0.2963	0.3165	0.3273	0.3704	0.2815	0.2820
42	0.4063	0.3588	0.3543	0.3416	0.3309	0.2940	0.3121	0.3226	0.3649	0.2784	0.2802
43	0.4167	0.3579	0.3536	0.3410	0.3294	0.2918	0.3077	0.3179	0.3595	0.2753	0.2785
44	0.4271	0.3587	0.3548	0.3427	0.3313	0.2947	0.3129	0.3244	0.3672	0.2796	0.2811
45	0.4375	0.3591	0.3558	0.3441	0.3329	0.2975	0.3180	0.3311	0.3754	0.2840	0.2836
46	0.4479	0.3588	0.3560	0.3449	0.3335	0.2988	0.3204	0.3350	0.3802	0.2865	0.2849
47	0.4583	0.3597	0.3575	0.3469	0.3359	0.3033	0.3288	0.3455	0.3931	0.2933	0.2888
48	0.4688	0.3590	0.3573	0.3470	0.3357	0.3041	0.3308	0.3488	0.3972	0.2951	0.2894
49	0.4792	0.3565	0.3551	0.3448	0.3326	0.3014	0.3270	0.3453	0.3932	0.2923	0.2868
50	0.4896	0.3559	0.3547	0.3446	0.3322	0.3017	0.3283	0.3472	0.3957	0.2933	0.2870

51	0.5000	0.3552	0.3544	0.3444	0.3318	0.3022	0.3297	0.3493	0.3984	0.2944	0.2872
52	0.5104	0.3530	0.3522	0.3420	0.3285	0.2987	0.3246	0.3436	0.3918	0.2902	0.2839
53	0.5208	0.3511	0.3504	0.3400	0.3261	0.2965	0.3219	0.3405	0.3883	0.2877	0.2816
54	0.5313	0.3492	0.3484	0.3378	0.3234	0.2937	0.3180	0.3361	0.3833	0.2844	0.2789
55	0.5417	0.3469	0.3460	0.3351	0.3202	0.2902	0.3127	0.3302	0.3764	0.2801	0.2756
56	0.5521	0.3446	0.3437	0.3325	0.3171	0.2867	0.3074	0.3243	0.3695	0.2758	0.2722
57	0.5625	0.3403	0.3391	0.3273	0.3107	0.2798	0.2971	0.3124	0.3556	0.2671	0.2656
58	0.5729	0.3359	0.3344	0.3220	0.3043	0.2730	0.2873	0.3009	0.3423	0.2586	0.2589
59	0.5833	0.3321	0.3305	0.3175	0.2989	0.2675	0.2797	0.2920	0.3321	0.2518	0.2535
60	0.5938	0.3278	0.3260	0.3124	0.2929	0.2614	0.2714	0.2824	0.3211	0.2444	0.2475
61	0.6042	0.3227	0.3206	0.3065	0.2862	0.2545	0.2621	0.2718	0.3091	0.2363	0.2407
62	0.6146	0.3199	0.3177	0.3031	0.2821	0.2510	0.2582	0.2667	0.3036	0.2320	0.2369
63	0.6250	0.3177	0.3154	0.3005	0.2789	0.2483	0.2554	0.2628	0.2995	0.2286	0.2340
64	0.6354	0.3144	0.3119	0.2966	0.2746	0.2438	0.2490	0.2556	0.2912	0.2232	0.2296
65	0.6458	0.3112	0.3084	0.2927	0.2703	0.2392	0.2426	0.2485	0.2830	0.2178	0.2252
66	0.6563	0.3070	0.3040	0.2878	0.2649	0.2338	0.2356	0.2403	0.2738	0.2115	0.2199
67	0.6667	0.3019	0.2985	0.2817	0.2582	0.2269	0.2262	0.2297	0.2617	0.2034	0.2131
68	0.6771	0.2996	0.2961	0.2790	0.2551	0.2239	0.2225	0.2251	0.2567	0.1998	0.2101
69	0.6875	0.2974	0.2937	0.2763	0.2520	0.2210	0.2188	0.2206	0.2516	0.1962	0.2071
70	0.6979	0.2952	0.2913	0.2737	0.2491	0.2181	0.2154	0.2164	0.2470	0.1928	0.2043
71	0.7083	0.2919	0.2878	0.2697	0.2445	0.2138	0.2100	0.2095	0.2396	0.1874	0.1998
72	0.7188	0.2886	0.2842	0.2657	0.2399	0.2094	0.2046	0.2027	0.2321	0.1820	0.1954
73	0.7292	0.2849	0.2803	0.2613	0.2351	0.2048	0.1991	0.1960	0.2248	0.1767	0.1908
74	0.7396	0.2805	0.2756	0.2562	0.2294	0.1994	0.1928	0.1882	0.2164	0.1704	0.1853
75	0.7500	0.2740	0.2686	0.2485	0.2212	0.1910	0.1823	0.1759	0.2027	0.1610	0.1772
76	0.7604	0.2673	0.2614	0.2408	0.2129	0.1826	0.1719	0.1637	0.1891	0.1514	0.1690
77	0.7708	0.2606	0.2543	0.2330	0.2045	0.1742	0.1615	0.1514	0.1755	0.1419	0.1608
78	0.7812	0.2512	0.2441	0.2220	0.1930	0.1630	0.1487	0.1365	0.1593	0.1297	0.1498
79	0.7917	0.2416	0.2338	0.2111	0.1815	0.1520	0.1366	0.1220	0.1438	0.1178	0.1389
80	0.8021	0.2319	0.2234	0.2000	0.1699	0.1411	0.1253	0.1085	0.1296	0.1063	0.1281
81	0.8125	0.2222	0.2129	0.1889	0.1584	0.1302	0.1140	0.0950	0.1153	0.0948	0.1174
82	0.8229	0.2154	0.2056	0.1812	0.1505	0.1223	0.1055	0.0851	0.1045	0.0867	0.1098
83	0.8333	0.2094	0.1991	0.1744	0.1435	0.1152	0.0975	0.0760	0.0946	0.0794	0.1031
84	0.8437	0.2017	0.1908	0.1657	0.1344	0.1066	0.0891	0.0654	0.0835	0.0705	0.0946
85	0.8542	0.1996	0.1885	0.1632	0.1316	0.1042	0.0869	0.0620	0.0801	0.0678	0.0922
86	0.8646	0.1976	0.1862	0.1607	0.1289	0.1017	0.0848	0.0586	0.0767	0.0651	0.0897
87	0.8750	0.1952	0.1836	0.1579	0.1257	0.0989	0.0823	0.0546	0.0727	0.0620	0.0869
88	0.8854	0.1916	0.1797	0.1537	0.1212	0.0948	0.0783	0.0489	0.0668	0.0575	0.0828
89	0.8958	0.1887	0.1765	0.1503	0.1175	0.0913	0.0750	0.0441	0.0618	0.0537	0.0794
90	0.9062	0.1849	0.1724	0.1459	0.1128	0.0869	0.0705	0.0379	0.0552	0.0490	0.0750
91	0.9167	0.1827	0.1699	0.1432	0.1098	0.0840	0.0675	0.0334	0.0505	0.0457	0.0722
92	0.9271	0.1810	0.1679	0.1411	0.1073	0.0815	0.0648	0.0288	0.0457	0.0425	0.0698
93	0.9375	0.1799	0.1666	0.1395	0.1052	0.0795	0.0626	0.0243	0.0411	0.0396	0.0678
94	0.9479	0.1789	0.1653	0.1378	0.1031	0.0774	0.0601	0.0189	0.0356	0.0364	0.0657
95	0.9583	0.1779	0.1640	0.1362	0.1008	0.0753	0.0576	0.0135	0.0300	0.0331	0.0636
96	0.9687	0.1769	0.1627	0.1346	0.0987	0.0733	0.0553	0.0085	0.0248	0.0300	0.0616
97	0.9792	0.1765	0.1621	0.1338	0.0976	0.0722	0.0538	0.0052	0.0213	0.0280	0.0605
98	0.9896	0.1764	0.1619	0.1334	0.0969	0.0714	0.0526	0.0026	0.0186	0.0265	0.0597
99	1.0000	0.1763	0.1616	0.1330	0.0963	0.0707	0.0513	0.0000	0.0159	0.0250	0.0590
100											
101											

d56_k06ss1sc20

-1		0.87093	0.092625	0.778305					
		Upleg velocity (m/s)							
Point no.	y/D	4.1	3.9	3.6	3.2	2.8	2.4	2.1	1.6
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.6085	0.6146	0.5810	0.4883	0.3640	0.2759	0.2043	0.1251
3	0.0000	0.6072	0.6132	0.5789	0.4848	0.3597	0.2715	0.1996	0.1203
4	0.0104	0.6052	0.6110	0.5756	0.4796	0.3543	0.2660	0.1939	0.1139
5	0.0208	0.6032	0.6089	0.5723	0.4746	0.3490	0.2608	0.1883	0.1075
6	0.0313	0.6010	0.6067	0.5694	0.4711	0.3456	0.2575	0.1847	0.1033
7	0.0417	0.5988	0.6046	0.5666	0.4680	0.3429	0.2549	0.1817	0.0997
8	0.0521	0.5966	0.6024	0.5639	0.4649	0.3401	0.2523	0.1788	0.0962
9	0.0625	0.5944	0.6003	0.5611	0.4618	0.3373	0.2497	0.1758	0.0926
10	0.0729	0.5926	0.5988	0.5599	0.4625	0.3392	0.2520	0.1779	0.0942
11	0.0833	0.5912	0.5980	0.5603	0.4674	0.3463	0.2598	0.1854	0.1015
12	0.0938	0.5898	0.5972	0.5608	0.4722	0.3534	0.2677	0.1930	0.1088
13	0.1042	0.5876	0.5955	0.5599	0.4750	0.3589	0.2742	0.1995	0.1146
14	0.1146	0.5840	0.5920	0.5568	0.4747	0.3628	0.2798	0.2056	0.1192
15	0.1250	0.5826	0.5908	0.5563	0.4770	0.3683	0.2869	0.2135	0.1264
16	0.1354	0.5825	0.5910	0.5577	0.4817	0.3751	0.2945	0.2214	0.1343
17	0.1458	0.5824	0.5913	0.5592	0.4864	0.3819	0.3021	0.2293	0.1422
18	0.1563	0.5826	0.5918	0.5610	0.4914	0.3890	0.3101	0.2378	0.1507
19	0.1667	0.5830	0.5925	0.5630	0.4969	0.3967	0.3187	0.2468	0.1598
20	0.1771	0.5831	0.5929	0.5647	0.5019	0.4039	0.3268	0.2554	0.1684
21	0.1875	0.5823	0.5924	0.5651	0.5048	0.4085	0.3321	0.2608	0.1738
22	0.1979	0.5813	0.5915	0.5645	0.5050	0.4094	0.3331	0.2618	0.1750
23	0.2083	0.5785	0.5886	0.5614	0.5019	0.4078	0.3320	0.2608	0.1735
24	0.2188	0.5751	0.5850	0.5577	0.4982	0.4063	0.3311	0.2596	0.1715
25	0.2292	0.5730	0.5828	0.5557	0.4969	0.4067	0.3321	0.2607	0.1722
26	0.2396	0.5674	0.5772	0.5502	0.4923	0.4062	0.3333	0.2626	0.1739
27	0.2500	0.5607	0.5703	0.5436	0.4867	0.4055	0.3345	0.2648	0.1760
28	0.2604	0.5512	0.5601	0.5320	0.4727	0.3955	0.3256	0.2552	0.1647
29	0.2708	0.5436	0.5519	0.5221	0.4596	0.3845	0.3148	0.2434	0.1512
30	0.2813	0.5411	0.5493	0.5204	0.4602	0.3910	0.3247	0.2553	0.1635
31	0.2917	0.5390	0.5475	0.5204	0.4639	0.4005	0.3376	0.2709	0.1812
32	0.3021	0.5391	0.5481	0.5243	0.4743	0.4174	0.3586	0.2955	0.2088
33	0.3125	0.5391	0.5488	0.5282	0.4848	0.4345	0.3798	0.3203	0.2366
34	0.3229	0.5392	0.5496	0.5322	0.4952	0.4515	0.4007	0.3448	0.2641
35	0.3333	0.5399	0.5507	0.5361	0.5050	0.4667	0.4194	0.3665	0.2882
36	0.3438	0.5413	0.5528	0.5418	0.5175	0.4864	0.4436	0.3947	0.3198
37	0.3542	0.5439	0.5557	0.5471	0.5276	0.5022	0.4636	0.4180	0.3460
38	0.3646	0.5468	0.5591	0.5535	0.5397	0.5201	0.4855	0.4434	0.3745
39	0.3750	0.5501	0.5630	0.5607	0.5535	0.5397	0.5090	0.4706	0.4050
40	0.3854	0.5511	0.5643	0.5637	0.5595	0.5492	0.5208	0.4843	0.4205
41	0.3958	0.5502	0.5633	0.5631	0.5591	0.5505	0.5228	0.4868	0.4236
42	0.4063	0.5507	0.5638	0.5644	0.5614	0.5543	0.5274	0.4921	0.4296
43	0.4167	0.5512	0.5644	0.5656	0.5637	0.5580	0.5319	0.4974	0.4356
44	0.4271	0.5498	0.5627	0.5639	0.5607	0.5553	0.5285	0.4934	0.4312
45	0.4375	0.5487	0.5613	0.5625	0.5581	0.5534	0.5263	0.4908	0.4286
46	0.4479	0.5483	0.5607	0.5621	0.5571	0.5537	0.5267	0.4913	0.4295
47	0.4583	0.5466	0.5586	0.5599	0.5529	0.5497	0.5217	0.4855	0.4231
48	0.4688	0.5468	0.5586	0.5602	0.5528	0.5507	0.5228	0.4866	0.4247

49	0.4792	0.5491	0.5609	0.5634	0.5569	0.5563	0.5295	0.4943	0.4336
50	0.4896	0.5493	0.5610	0.5638	0.5571	0.5570	0.5300	0.4949	0.4344
51	0.5000	0.5495	0.5611	0.5642	0.5571	0.5576	0.5305	0.4953	0.4349
52	0.5104	0.5517	0.5635	0.5672	0.5613	0.5627	0.5363	0.5020	0.4425
53	0.5208	0.5535	0.5653	0.5695	0.5641	0.5659	0.5399	0.5060	0.4471
54	0.5313	0.5555	0.5674	0.5721	0.5675	0.5699	0.5445	0.5113	0.4531
55	0.5417	0.5579	0.5701	0.5753	0.5719	0.5749	0.5505	0.5182	0.4609
56	0.5521	0.5604	0.5727	0.5784	0.5762	0.5799	0.5564	0.5250	0.4688
57	0.5625	0.5649	0.5775	0.5843	0.5843	0.5891	0.5671	0.5372	0.4825
58	0.5729	0.5696	0.5825	0.5904	0.5925	0.5982	0.5774	0.5490	0.4957
59	0.5833	0.5734	0.5867	0.5953	0.5990	0.6053	0.5855	0.5581	0.5059
60	0.5938	0.5779	0.5915	0.6009	0.6063	0.6133	0.5946	0.5685	0.5175
61	0.6042	0.5832	0.5971	0.6075	0.6146	0.6224	0.6051	0.5803	0.5309
62	0.6146	0.5859	0.5998	0.6108	0.6186	0.6264	0.6089	0.5846	0.5353
63	0.6250	0.5878	0.6019	0.6133	0.6216	0.6293	0.6116	0.5875	0.5383
64	0.6354	0.5914	0.6057	0.6176	0.6272	0.6355	0.6189	0.5959	0.5477
65	0.6458	0.5950	0.6095	0.6219	0.6327	0.6416	0.6262	0.6042	0.5572
66	0.6563	0.5993	0.6141	0.6270	0.6391	0.6485	0.6341	0.6132	0.5673
67	0.6667	0.6048	0.6199	0.6336	0.6474	0.6575	0.6449	0.6255	0.5813
68	0.6771	0.6071	0.6224	0.6364	0.6510	0.6612	0.6488	0.6300	0.5861
69	0.6875	0.6095	0.6248	0.6392	0.6545	0.6648	0.6528	0.6345	0.5908
70	0.6979	0.6117	0.6272	0.6419	0.6578	0.6683	0.6566	0.6388	0.5955
71	0.7083	0.6152	0.6309	0.6462	0.6631	0.6737	0.6624	0.6453	0.6024
72	0.7188	0.6187	0.6346	0.6504	0.6685	0.6792	0.6683	0.6519	0.6094
73	0.7292	0.6225	0.6386	0.6548	0.6738	0.6847	0.6745	0.6590	0.6172
74	0.7396	0.6271	0.6433	0.6601	0.6801	0.6912	0.6817	0.6673	0.6261
75	0.7500	0.6339	0.6505	0.6679	0.6897	0.7016	0.6941	0.6817	0.6421
76	0.7604	0.6408	0.6577	0.6759	0.6994	0.7120	0.7063	0.6959	0.6580
77	0.7708	0.6478	0.6650	0.6840	0.7091	0.7225	0.7186	0.7101	0.6739
78	0.7812	0.6579	0.6755	0.6953	0.7219	0.7359	0.7346	0.7286	0.6949
79	0.7917	0.6682	0.6862	0.7066	0.7345	0.7491	0.7501	0.7467	0.7154
80	0.8021	0.6787	0.6970	0.7180	0.7466	0.7615	0.7650	0.7639	0.7354
81	0.8125	0.6892	0.7078	0.7295	0.7587	0.7740	0.7798	0.7811	0.7553
82	0.8229	0.6966	0.7155	0.7375	0.7673	0.7832	0.7913	0.7947	0.7713
83	0.8333	0.7032	0.7223	0.7447	0.7750	0.7916	0.8020	0.8074	0.7863
84	0.8437	0.7117	0.7310	0.7538	0.7843	0.8012	0.8135	0.8209	0.8019
85	0.8542	0.7142	0.7336	0.7565	0.7872	0.8039	0.8165	0.8244	0.8057
86	0.8646	0.7167	0.7362	0.7592	0.7900	0.8066	0.8194	0.8279	0.8093
87	0.8750	0.7197	0.7392	0.7624	0.7933	0.8099	0.8230	0.8322	0.8139
88	0.8854	0.7239	0.7435	0.7670	0.7982	0.8148	0.8287	0.8389	0.8212
89	0.8958	0.7274	0.7471	0.7708	0.8020	0.8185	0.8329	0.8440	0.8269
90	0.9062	0.7320	0.7518	0.7757	0.8071	0.8238	0.8394	0.8517	0.8355
91	0.9167	0.7349	0.7548	0.7789	0.8104	0.8271	0.8433	0.8564	0.8409
92	0.9271	0.7373	0.7573	0.7816	0.8134	0.8299	0.8462	0.8598	0.8446
93	0.9375	0.7392	0.7593	0.7838	0.8159	0.8321	0.8484	0.8623	0.8469
94	0.9479	0.7412	0.7615	0.7863	0.8188	0.8346	0.8505	0.8647	0.8488
95	0.9583	0.7432	0.7636	0.7887	0.8216	0.8370	0.8526	0.8671	0.8506
96	0.9687	0.7452	0.7658	0.7911	0.8244	0.8394	0.8547	0.8694	0.8524
97	0.9792	0.7462	0.7668	0.7924	0.8260	0.8407	0.8556	0.8705	0.8530
98	0.9896	0.7467	0.7674	0.7931	0.8270	0.8414	0.8560	0.8707	0.8528
99	1.0000	0.7472	0.7680	0.7939	0.8280	0.8422	0.8564	0.8709	0.8526
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		0.87093	0.092625	0.778305					
		Upleg velocity (m/s). Normalised conductivities							
Point no.	y/D	4.1	3.9	3.6	3.2	2.8	2.4	2.1	1.6
1									
2		0.3372	0.3294	0.3726	0.4916	0.6514	0.7645	0.8565	0.9583
3	0.0000	0.3388	0.3312	0.3752	0.4962	0.6568	0.7702	0.8625	0.9644
4	0.0104	0.3415	0.3340	0.3795	0.5028	0.6639	0.7773	0.8699	0.9727
5	0.0208	0.3440	0.3367	0.3837	0.5092	0.6706	0.7840	0.8771	0.9808
6	0.0313	0.3468	0.3395	0.3875	0.5138	0.6749	0.7881	0.8817	0.9863
7	0.0417	0.3496	0.3422	0.3910	0.5177	0.6785	0.7915	0.8855	0.9908
8	0.0521	0.3525	0.3450	0.3945	0.5217	0.6821	0.7949	0.8893	0.9954
9	0.0625	0.3553	0.3477	0.3981	0.5256	0.6857	0.7982	0.8931	1.0000
10	0.0729	0.3576	0.3496	0.3996	0.5247	0.6832	0.7952	0.8905	0.9980
11	0.0833	0.3594	0.3506	0.3991	0.5185	0.6741	0.7852	0.8808	0.9886
12	0.0938	0.3612	0.3516	0.3985	0.5123	0.6649	0.7751	0.8710	0.9792
13	0.1042	0.3641	0.3539	0.3997	0.5088	0.6579	0.7667	0.8627	0.9718
14	0.1146	0.3686	0.3583	0.4036	0.5091	0.6529	0.7595	0.8549	0.9659
15	0.1250	0.3705	0.3599	0.4042	0.5062	0.6458	0.7503	0.8447	0.9566
16	0.1354	0.3706	0.3597	0.4024	0.5001	0.6371	0.7406	0.8346	0.9465
17	0.1458	0.3707	0.3593	0.4005	0.4940	0.6284	0.7309	0.8244	0.9363
18	0.1563	0.3705	0.3587	0.3983	0.4876	0.6192	0.7206	0.8135	0.9254
19	0.1667	0.3699	0.3577	0.3956	0.4805	0.6093	0.7095	0.8019	0.9137
20	0.1771	0.3699	0.3572	0.3934	0.4741	0.6001	0.6991	0.7909	0.9027
21	0.1875	0.3709	0.3579	0.3930	0.4705	0.5941	0.6924	0.7840	0.8957
22	0.1979	0.3722	0.3591	0.3937	0.4701	0.5929	0.6910	0.7826	0.8942
23	0.2083	0.3758	0.3628	0.3977	0.4741	0.5950	0.6924	0.7840	0.8961
24	0.2188	0.3801	0.3674	0.4025	0.4788	0.5969	0.6936	0.7854	0.8987
25	0.2292	0.3828	0.3702	0.4051	0.4806	0.5964	0.6924	0.7841	0.8978
26	0.2396	0.3900	0.3775	0.4121	0.4864	0.5971	0.6908	0.7816	0.8955
27	0.2500	0.3986	0.3863	0.4206	0.4936	0.5981	0.6892	0.7788	0.8928
28	0.2604	0.4109	0.3994	0.4355	0.5117	0.6109	0.7007	0.7911	0.9074
29	0.2708	0.4205	0.4099	0.4482	0.5286	0.6249	0.7145	0.8063	0.9247
30	0.2813	0.4238	0.4133	0.4504	0.5278	0.6166	0.7018	0.7910	0.9089
31	0.2917	0.4264	0.4156	0.4504	0.5230	0.6045	0.6853	0.7709	0.8862
32	0.3021	0.4264	0.4148	0.4454	0.5096	0.5827	0.6583	0.7393	0.8507
33	0.3125	0.4263	0.4139	0.4403	0.4961	0.5607	0.6311	0.7075	0.8150
34	0.3229	0.4262	0.4129	0.4353	0.4827	0.5390	0.6041	0.6760	0.7797
35	0.3333	0.4254	0.4114	0.4302	0.4702	0.5194	0.5802	0.6481	0.7488
36	0.3438	0.4235	0.4087	0.4229	0.4541	0.4941	0.5490	0.6119	0.7082
37	0.3542	0.4202	0.4050	0.4160	0.4411	0.4737	0.5234	0.5820	0.6744
38	0.3646	0.4165	0.4006	0.4079	0.4256	0.4508	0.4953	0.5494	0.6378
39	0.3750	0.4123	0.3956	0.3986	0.4078	0.4256	0.4650	0.5143	0.5987
40	0.3854	0.4110	0.3940	0.3948	0.4002	0.4134	0.4499	0.4967	0.5787
41	0.3958	0.4121	0.3952	0.3955	0.4007	0.4117	0.4473	0.4935	0.5747
42	0.4063	0.4115	0.3946	0.3939	0.3977	0.4069	0.4414	0.4868	0.5670
43	0.4167	0.4108	0.3939	0.3923	0.3948	0.4020	0.4356	0.4800	0.5593
44	0.4271	0.4126	0.3960	0.3945	0.3986	0.4056	0.4400	0.4851	0.5649
45	0.4375	0.4141	0.3978	0.3963	0.4019	0.4080	0.4428	0.4884	0.5683
46	0.4479	0.4146	0.3986	0.3968	0.4032	0.4076	0.4423	0.4877	0.5671
47	0.4583	0.4167	0.4013	0.3997	0.4086	0.4127	0.4487	0.4953	0.5754
48	0.4688	0.4165	0.4013	0.3992	0.4087	0.4115	0.4473	0.4938	0.5733
49	0.4792	0.4136	0.3984	0.3952	0.4035	0.4043	0.4387	0.4839	0.5619
50	0.4896	0.4132	0.3982	0.3946	0.4033	0.4034	0.4380	0.4832	0.5609

51	0.5000	0.4130	0.3981	0.3941	0.4033	0.4026	0.4375	0.4826	0.5602
52	0.5104	0.4101	0.3951	0.3902	0.3979	0.3961	0.4300	0.4741	0.5505
53	0.5208	0.4079	0.3927	0.3873	0.3942	0.3919	0.4254	0.4688	0.5446
54	0.5313	0.4053	0.3899	0.3839	0.3898	0.3868	0.4194	0.4620	0.5368
55	0.5417	0.4021	0.3866	0.3799	0.3843	0.3804	0.4117	0.4533	0.5268
56	0.5521	0.3990	0.3832	0.3759	0.3787	0.3739	0.4041	0.4445	0.5167
57	0.5625	0.3932	0.3770	0.3682	0.3682	0.3621	0.3904	0.4288	0.4991
58	0.5729	0.3872	0.3705	0.3605	0.3578	0.3505	0.3771	0.4136	0.4821
59	0.5833	0.3822	0.3652	0.3541	0.3494	0.3413	0.3668	0.4019	0.4690
60	0.5938	0.3765	0.3591	0.3469	0.3400	0.3310	0.3551	0.3886	0.4541
61	0.6042	0.3696	0.3519	0.3385	0.3294	0.3193	0.3416	0.3734	0.4368
62	0.6146	0.3663	0.3483	0.3343	0.3242	0.3142	0.3367	0.3679	0.4312
63	0.6250	0.3637	0.3457	0.3311	0.3203	0.3104	0.3333	0.3641	0.4274
64	0.6354	0.3591	0.3408	0.3255	0.3132	0.3026	0.3239	0.3534	0.4153
65	0.6458	0.3546	0.3359	0.3200	0.3061	0.2947	0.3145	0.3427	0.4031
66	0.6563	0.3490	0.3301	0.3134	0.2978	0.2859	0.3043	0.3311	0.3901
67	0.6667	0.3419	0.3225	0.3049	0.2872	0.2742	0.2904	0.3153	0.3721
68	0.6771	0.3389	0.3194	0.3013	0.2826	0.2695	0.2854	0.3096	0.3660
69	0.6875	0.3359	0.3162	0.2977	0.2781	0.2648	0.2803	0.3038	0.3599
70	0.6979	0.3330	0.3132	0.2942	0.2738	0.2604	0.2754	0.2983	0.3539
71	0.7083	0.3285	0.3084	0.2888	0.2670	0.2534	0.2679	0.2899	0.3450
72	0.7188	0.3240	0.3037	0.2834	0.2601	0.2464	0.2604	0.2814	0.3361
73	0.7292	0.3192	0.2986	0.2777	0.2533	0.2393	0.2524	0.2723	0.3261
74	0.7396	0.3133	0.2925	0.2709	0.2452	0.2310	0.2431	0.2617	0.3146
75	0.7500	0.3045	0.2833	0.2608	0.2329	0.2176	0.2273	0.2432	0.2940
76	0.7604	0.2956	0.2739	0.2505	0.2204	0.2042	0.2115	0.2249	0.2736
77	0.7708	0.2867	0.2646	0.2402	0.2080	0.1908	0.1958	0.2066	0.2532
78	0.7812	0.2737	0.2511	0.2257	0.1915	0.1735	0.1752	0.1828	0.2262
79	0.7917	0.2605	0.2374	0.2111	0.1753	0.1566	0.1552	0.1597	0.1998
80	0.8021	0.2470	0.2235	0.1964	0.1598	0.1406	0.1361	0.1376	0.1742
81	0.8125	0.2335	0.2095	0.1818	0.1443	0.1246	0.1170	0.1154	0.1486
82	0.8229	0.2240	0.1998	0.1714	0.1332	0.1127	0.1023	0.0980	0.1281
83	0.8333	0.2155	0.1910	0.1622	0.1233	0.1019	0.0886	0.0817	0.1088
84	0.8437	0.2046	0.1798	0.1506	0.1113	0.0896	0.0738	0.0643	0.0887
85	0.8542	0.2014	0.1765	0.1470	0.1076	0.0861	0.0700	0.0598	0.0839
86	0.8646	0.1981	0.1732	0.1435	0.1039	0.0826	0.0662	0.0553	0.0792
87	0.8750	0.1943	0.1693	0.1395	0.0997	0.0784	0.0616	0.0498	0.0733
88	0.8854	0.1889	0.1637	0.1335	0.0935	0.0722	0.0543	0.0411	0.0639
89	0.8958	0.1844	0.1591	0.1287	0.0886	0.0674	0.0488	0.0347	0.0566
90	0.9062	0.1786	0.1531	0.1224	0.0820	0.0605	0.0405	0.0247	0.0455
91	0.9167	0.1748	0.1492	0.1183	0.0777	0.0563	0.0355	0.0186	0.0385
92	0.9271	0.1717	0.1460	0.1148	0.0740	0.0528	0.0317	0.0142	0.0338
93	0.9375	0.1693	0.1434	0.1119	0.0707	0.0498	0.0290	0.0111	0.0309
94	0.9479	0.1667	0.1406	0.1088	0.0670	0.0467	0.0263	0.0080	0.0285
95	0.9583	0.1641	0.1379	0.1056	0.0634	0.0436	0.0236	0.0049	0.0261
96	0.9687	0.1615	0.1351	0.1025	0.0598	0.0405	0.0209	0.0019	0.0238
97	0.9792	0.1603	0.1338	0.1009	0.0578	0.0389	0.0196	0.0006	0.0231
98	0.9896	0.1596	0.1330	0.0999	0.0565	0.0379	0.0192	0.0003	0.0234
99	1.0000	0.1589	0.1322	0.0990	0.0552	0.0369	0.0187	0.0000	0.0236
100									
101									

d56_k06ss1ssc30

-1		0.82318	- 0.03936	0.862536						
		Upleg velocity (m/s)								
Point no.	y/D	4.2	4.0	3.7	3.4	3.1	2.8	2.4	1.7	2.0
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.5157	0.5129	0.4598	0.3486	0.2701	0.1935	0.1502	0.0604	0.1172
3	0.0000	0.5143	0.5112	0.4573	0.3447	0.2651	0.1894	0.1466	0.0566	0.1136
4	0.0104	0.5120	0.5084	0.4532	0.3391	0.2589	0.1842	0.1418	0.0512	0.1089
5	0.0208	0.5097	0.5056	0.4493	0.3337	0.2528	0.1792	0.1372	0.0460	0.1043
6	0.0313	0.5066	0.5024	0.4454	0.3288	0.2473	0.1744	0.1327	0.0404	0.0996
7	0.0417	0.5033	0.4990	0.4416	0.3241	0.2419	0.1698	0.1283	0.0347	0.0949
8	0.0521	0.5001	0.4956	0.4378	0.3194	0.2366	0.1652	0.1239	0.0291	0.0902
9	0.0625	0.4968	0.4922	0.4339	0.3148	0.2312	0.1606	0.1195	0.0234	0.0855
10	0.0729	0.4932	0.4890	0.4315	0.3129	0.2292	0.1585	0.1173	0.0192	0.0826
11	0.0833	0.4892	0.4860	0.4304	0.3139	0.2307	0.1593	0.1173	0.0167	0.0815
12	0.0938	0.4853	0.4829	0.4293	0.3150	0.2323	0.1600	0.1174	0.0141	0.0804
13	0.1042	0.4802	0.4785	0.4264	0.3142	0.2324	0.1596	0.1163	0.0102	0.0781
14	0.1146	0.4732	0.4717	0.4206	0.3109	0.2314	0.1586	0.1143	0.0053	0.0749
15	0.1250	0.4696	0.4685	0.4187	0.3115	0.2341	0.1613	0.1164	0.0055	0.0762
16	0.1354	0.4680	0.4676	0.4194	0.3145	0.2384	0.1649	0.1194	0.0074	0.0786
17	0.1458	0.4664	0.4667	0.4202	0.3176	0.2428	0.1685	0.1224	0.0092	0.0810
18	0.1563	0.4652	0.4662	0.4214	0.3214	0.2479	0.1731	0.1265	0.0123	0.0845
19	0.1667	0.4644	0.4661	0.4231	0.3257	0.2537	0.1784	0.1314	0.0163	0.0889
20	0.1771	0.4631	0.4655	0.4242	0.3294	0.2588	0.1829	0.1353	0.0193	0.0924
21	0.1875	0.4607	0.4635	0.4236	0.3305	0.2609	0.1844	0.1363	0.0192	0.0928
22	0.1979	0.4586	0.4616	0.4221	0.3294	0.2598	0.1831	0.1348	0.0170	0.0910
23	0.2083	0.4541	0.4568	0.4171	0.3248	0.2560	0.1794	0.1308	0.0121	0.0868
24	0.2188	0.4488	0.4511	0.4114	0.3201	0.2524	0.1760	0.1266	0.0067	0.0824
25	0.2292	0.4451	0.4474	0.4080	0.3177	0.2510	0.1747	0.1249	0.0042	0.0806
26	0.2396	0.4356	0.4376	0.3988	0.3104	0.2460	0.1708	0.1209	-0.0010	0.0767
27	0.2500	0.4240	0.4257	0.3876	0.3015	0.2397	0.1661	0.1160	-0.0072	0.0721
28	0.2604	0.4101	0.4103	0.3708	0.2851	0.2252	0.1527	0.1015	-0.0238	0.0576
29	0.2708	0.3998	0.3985	0.3572	0.2708	0.2114	0.1396	0.0874	-0.0394	0.0437
30	0.2813	0.3946	0.3933	0.3539	0.2724	0.2174	0.1489	0.0974	-0.0283	0.0551
31	0.2917	0.3892	0.3885	0.3520	0.2758	0.2248	0.1600	0.1100	-0.0137	0.0698
32	0.3021	0.3858	0.3865	0.3545	0.2859	0.2395	0.1783	0.1301	0.0085	0.0920
33	0.3125	0.3824	0.3845	0.3572	0.2961	0.2542	0.1968	0.1503	0.0309	0.1144
34	0.3229	0.3792	0.3826	0.3599	0.3062	0.2689	0.2150	0.1702	0.0531	0.1364
35	0.3333	0.3772	0.3818	0.3632	0.3158	0.2825	0.2315	0.1881	0.0727	0.1559
36	0.3438	0.3759	0.3820	0.3685	0.3297	0.3016	0.2552	0.2138	0.1019	0.1845
37	0.3542	0.3772	0.3843	0.3748	0.3432	0.3200	0.2785	0.2394	0.1319	0.2132
38	0.3646	0.3788	0.3872	0.3820	0.3580	0.3395	0.3025	0.2656	0.1620	0.2423
39	0.3750	0.3806	0.3904	0.3901	0.3740	0.3602	0.3272	0.2924	0.1922	0.2716
40	0.3854	0.3805	0.3909	0.3933	0.3818	0.3705	0.3402	0.3064	0.2086	0.2875
41	0.3958	0.3790	0.3892	0.3924	0.3828	0.3724	0.3435	0.3100	0.2134	0.2923
42	0.4063	0.3792	0.3895	0.3938	0.3864	0.3769	0.3492	0.3160	0.2206	0.2992
43	0.4167	0.3793	0.3898	0.3952	0.3899	0.3813	0.3548	0.3220	0.2277	0.3061
44	0.4271	0.3778	0.3876	0.3930	0.3883	0.3789	0.3522	0.3185	0.2244	0.3030
45	0.4375	0.3765	0.3856	0.3914	0.3881	0.3781	0.3519	0.3176	0.2244	0.3031
46	0.4479	0.3760	0.3846	0.3912	0.3897	0.3798	0.3549	0.3204	0.2287	0.3072
47	0.4583	0.3743	0.3819	0.3885	0.3879	0.3767	0.3517	0.3159	0.2247	0.3034
48	0.4688	0.3747	0.3819	0.3892	0.3906	0.3795	0.3555	0.3195	0.2299	0.3082
49	0.4792	0.3775	0.3849	0.3937	0.3978	0.3879	0.3660	0.3307	0.2435	0.3210

50	0.4896	0.3780	0.3851	0.3944	0.3997	0.3898	0.3684	0.3326	0.2464	0.3237
51	0.5000	0.3783	0.3852	0.3950	0.4016	0.3915	0.3705	0.3344	0.2491	0.3262
52	0.5104	0.3810	0.3883	0.3990	0.4073	0.3982	0.3784	0.3426	0.2589	0.3353
53	0.5208	0.3834	0.3908	0.4022	0.4115	0.4029	0.3836	0.3481	0.2654	0.3413
54	0.5313	0.3861	0.3938	0.4058	0.4161	0.4084	0.3900	0.3550	0.2736	0.3487
55	0.5417	0.3892	0.3974	0.4101	0.4216	0.4149	0.3979	0.3637	0.2838	0.3581
56	0.5521	0.3922	0.4010	0.4144	0.4270	0.4215	0.4058	0.3725	0.2940	0.3675
57	0.5625	0.3980	0.4077	0.4225	0.4370	0.4334	0.4193	0.3871	0.3109	0.3831
58	0.5729	0.4041	0.4146	0.4307	0.4471	0.4452	0.4326	0.4014	0.3274	0.3982
59	0.5833	0.4092	0.4204	0.4375	0.4554	0.4546	0.4430	0.4124	0.3402	0.4098
60	0.5938	0.4153	0.4272	0.4454	0.4647	0.4652	0.4551	0.4253	0.3553	0.4234
61	0.6042	0.4225	0.4353	0.4546	0.4755	0.4776	0.4691	0.4406	0.3732	0.4395
62	0.6146	0.4263	0.4393	0.4592	0.4809	0.4829	0.4741	0.4450	0.3782	0.4437
63	0.6250	0.4292	0.4424	0.4627	0.4849	0.4868	0.4774	0.4477	0.3813	0.4462
64	0.6354	0.4341	0.4479	0.4688	0.4919	0.4950	0.4871	0.4586	0.3940	0.4575
65	0.6458	0.4389	0.4534	0.4750	0.4989	0.5033	0.4968	0.4695	0.4067	0.4689
66	0.6563	0.4450	0.4601	0.4825	0.5072	0.5126	0.5073	0.4810	0.4201	0.4807
67	0.6667	0.4526	0.4687	0.4920	0.5178	0.5250	0.5217	0.4970	0.4389	0.4974
68	0.6771	0.4560	0.4724	0.4960	0.5223	0.5298	0.5267	0.5022	0.4448	0.5024
69	0.6875	0.4594	0.4761	0.5001	0.5269	0.5347	0.5318	0.5073	0.4507	0.5074
70	0.6979	0.4627	0.4797	0.5041	0.5312	0.5394	0.5367	0.5124	0.4567	0.5124
71	0.7083	0.4679	0.4853	0.5103	0.5380	0.5467	0.5441	0.5198	0.4651	0.5197
72	0.7188	0.4731	0.4910	0.5165	0.5448	0.5540	0.5515	0.5273	0.4736	0.5269
73	0.7292	0.4788	0.4971	0.5231	0.5518	0.5616	0.5597	0.5361	0.4839	0.5355
74	0.7396	0.4857	0.5045	0.5310	0.5602	0.5706	0.5691	0.5460	0.4956	0.5450
75	0.7500	0.4959	0.5157	0.5429	0.5728	0.5849	0.5852	0.5638	0.5167	0.5624
76	0.7604	0.5062	0.5270	0.5550	0.5856	0.5992	0.6013	0.5816	0.5378	0.5799
77	0.7708	0.5165	0.5382	0.5671	0.5984	0.6136	0.6174	0.5993	0.5590	0.5974
78	0.7812	0.5322	0.5550	0.5846	0.6163	0.6333	0.6397	0.6244	0.5893	0.6220
79	0.7917	0.5483	0.5722	0.6023	0.6343	0.6530	0.6620	0.6492	0.6195	0.6464
80	0.8021	0.5652	0.5900	0.6204	0.6522	0.6724	0.6840	0.6741	0.6500	0.6706
81	0.8125	0.5820	0.6077	0.6385	0.6701	0.6917	0.7059	0.6989	0.6806	0.6949
82	0.8229	0.5937	0.6202	0.6512	0.6827	0.7059	0.7227	0.7183	0.7048	0.7139
83	0.8333	0.6042	0.6314	0.6627	0.6941	0.7188	0.7381	0.7364	0.7274	0.7316
84	0.8437	0.6181	0.6459	0.6773	0.7083	0.7341	0.7553	0.7557	0.7518	0.7499
85	0.8542	0.6227	0.6505	0.6819	0.7128	0.7386	0.7596	0.7599	0.7572	0.7530
86	0.8646	0.6272	0.6551	0.6865	0.7172	0.7430	0.7638	0.7641	0.7625	0.7561
87	0.8750	0.6324	0.6603	0.6917	0.7223	0.7482	0.7691	0.7693	0.7691	0.7602
88	0.8854	0.6397	0.6679	0.6994	0.7298	0.7561	0.7773	0.7780	0.7799	0.7676
89	0.8958	0.6458	0.6741	0.7056	0.7358	0.7622	0.7837	0.7847	0.7887	0.7731
90	0.9062	0.6534	0.6821	0.7136	0.7436	0.7708	0.7931	0.7950	0.8015	0.7822
91	0.9167	0.6585	0.6873	0.7189	0.7487	0.7762	0.7989	0.8011	0.8097	0.7871
92	0.9271	0.6629	0.6917	0.7234	0.7531	0.7805	0.8029	0.8048	0.8152	0.7894
93	0.9375	0.6665	0.6953	0.7271	0.7569	0.7840	0.8056	0.8065	0.8180	0.7893
94	0.9479	0.6705	0.6992	0.7312	0.7610	0.7877	0.8080	0.8074	0.8198	0.7881
95	0.9583	0.6745	0.7032	0.7352	0.7651	0.7914	0.8105	0.8084	0.8215	0.7869
96	0.9687	0.6784	0.7070	0.7392	0.7692	0.7950	0.8129	0.8094	0.8232	0.7857
97	0.9792	0.6804	0.7090	0.7413	0.7713	0.7968	0.8138	0.8093	0.8232	0.7843
98	0.9896	0.6814	0.7100	0.7425	0.7726	0.7977	0.8140	0.8085	0.8224	0.7827
99	1.0000	0.6825	0.7110	0.7436	0.7738	0.7987	0.8142	0.8077	0.8215	0.7812
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1 0.82318 -0.03936 0.862536

Upleg velocity (m/s). Normalised conductivities

Point no.	y/D	4.2	4.0	3.7	3.4	3.1	2.8	2.4	1.7	2.0
1										
2		0.3565	0.3597	0.4213	0.5502	0.6412	0.7301	0.7802	0.8843	0.8186
3	0.0000	0.3581	0.3617	0.4242	0.5548	0.6470	0.7348	0.7844	0.8887	0.8226
4	0.0104	0.3608	0.3649	0.4289	0.5612	0.6542	0.7409	0.7900	0.8950	0.8282
5	0.0208	0.3635	0.3681	0.4335	0.5675	0.6613	0.7467	0.7954	0.9011	0.8335
6	0.0313	0.3670	0.3719	0.4379	0.5732	0.6677	0.7521	0.8005	0.9075	0.8389
7	0.0417	0.3708	0.3758	0.4424	0.5786	0.6739	0.7575	0.8056	0.9141	0.8443
8	0.0521	0.3746	0.3798	0.4468	0.5840	0.6801	0.7629	0.8107	0.9207	0.8498
9	0.0625	0.3784	0.3837	0.4513	0.5894	0.6863	0.7682	0.8158	0.9273	0.8552
10	0.0729	0.3825	0.3874	0.4541	0.5917	0.6887	0.7706	0.8184	0.9321	0.8587
11	0.0833	0.3872	0.3910	0.4554	0.5904	0.6869	0.7697	0.8183	0.9350	0.8599
12	0.0938	0.3918	0.3945	0.4567	0.5891	0.6851	0.7688	0.8183	0.9380	0.8612
13	0.1042	0.3977	0.3996	0.4600	0.5901	0.6850	0.7693	0.8196	0.9425	0.8639
14	0.1146	0.4058	0.4075	0.4667	0.5939	0.6861	0.7705	0.8218	0.9483	0.8675
15	0.1250	0.4100	0.4112	0.4689	0.5932	0.6830	0.7674	0.8194	0.9480	0.8660
16	0.1354	0.4118	0.4122	0.4681	0.5897	0.6780	0.7632	0.8159	0.9458	0.8633
17	0.1458	0.4137	0.4133	0.4672	0.5861	0.6729	0.7590	0.8125	0.9437	0.8605
18	0.1563	0.4150	0.4138	0.4658	0.5818	0.6670	0.7537	0.8077	0.9401	0.8564
19	0.1667	0.4159	0.4140	0.4638	0.5768	0.6602	0.7475	0.8021	0.9355	0.8513
20	0.1771	0.4175	0.4147	0.4625	0.5725	0.6543	0.7423	0.7975	0.9320	0.8473
21	0.1875	0.4202	0.4170	0.4633	0.5712	0.6519	0.7406	0.7963	0.9321	0.8468
22	0.1979	0.4226	0.4192	0.4650	0.5725	0.6532	0.7421	0.7981	0.9346	0.8489
23	0.2083	0.4280	0.4248	0.4708	0.5778	0.6576	0.7464	0.8028	0.9404	0.8538
24	0.2188	0.4341	0.4313	0.4774	0.5833	0.6617	0.7504	0.8076	0.9466	0.8589
25	0.2292	0.4383	0.4357	0.4813	0.5861	0.6634	0.7519	0.8095	0.9494	0.8610
26	0.2396	0.4494	0.4471	0.4920	0.5945	0.6692	0.7563	0.8143	0.9556	0.8655
27	0.2500	0.4628	0.4608	0.5050	0.6048	0.6765	0.7618	0.8199	0.9628	0.8708
28	0.2604	0.4790	0.4787	0.5245	0.6238	0.6933	0.7774	0.8367	0.9820	0.8876
29	0.2708	0.4909	0.4924	0.5402	0.6404	0.7093	0.7925	0.8530	1.0000	0.9037
30	0.2813	0.4969	0.4984	0.5440	0.6386	0.7023	0.7817	0.8415	0.9872	0.8905
31	0.2917	0.5032	0.5039	0.5463	0.6346	0.6937	0.7688	0.8268	0.9703	0.8734
32	0.3021	0.5071	0.5063	0.5433	0.6229	0.6768	0.7476	0.8035	0.9445	0.8477
33	0.3125	0.5110	0.5086	0.5402	0.6111	0.6596	0.7262	0.7802	0.9185	0.8218
34	0.3229	0.5148	0.5108	0.5371	0.5994	0.6427	0.7051	0.7570	0.8928	0.7962
35	0.3333	0.5171	0.5117	0.5333	0.5883	0.6269	0.6860	0.7363	0.8701	0.7737
36	0.3438	0.5186	0.5115	0.5271	0.5721	0.6047	0.6586	0.7065	0.8362	0.7405
37	0.3542	0.5170	0.5088	0.5198	0.5564	0.5834	0.6315	0.6768	0.8015	0.7072
38	0.3646	0.5152	0.5055	0.5114	0.5393	0.5607	0.6037	0.6464	0.7666	0.6735
39	0.3750	0.5132	0.5017	0.5021	0.5208	0.5368	0.5750	0.6154	0.7315	0.6395
40	0.3854	0.5132	0.5012	0.4984	0.5118	0.5248	0.5600	0.5991	0.7125	0.6211
41	0.3958	0.5149	0.5031	0.4995	0.5105	0.5227	0.5561	0.5950	0.7069	0.6155
42	0.4063	0.5148	0.5028	0.4978	0.5064	0.5175	0.5495	0.5880	0.6986	0.6075
43	0.4167	0.5146	0.5025	0.4962	0.5023	0.5123	0.5430	0.5811	0.6904	0.5994
44	0.4271	0.5164	0.5050	0.4987	0.5042	0.5151	0.5460	0.5851	0.6942	0.6030
45	0.4375	0.5179	0.5073	0.5005	0.5045	0.5160	0.5464	0.5862	0.6943	0.6030
46	0.4479	0.5184	0.5084	0.5009	0.5026	0.5140	0.5429	0.5829	0.6892	0.5982
47	0.4583	0.5204	0.5116	0.5039	0.5046	0.5176	0.5466	0.5881	0.6939	0.6026
48	0.4688	0.5200	0.5116	0.5031	0.5016	0.5144	0.5422	0.5839	0.6879	0.5970
49	0.4792	0.5167	0.5081	0.4980	0.4932	0.5046	0.5300	0.5710	0.6720	0.5823
50	0.4896	0.5162	0.5079	0.4972	0.4909	0.5025	0.5273	0.5688	0.6687	0.5791

51	0.5000	0.5158	0.5078	0.4965	0.4888	0.5005	0.5248	0.5667	0.6656	0.5762
52	0.5104	0.5126	0.5042	0.4917	0.4821	0.4927	0.5157	0.5571	0.6542	0.5656
53	0.5208	0.5099	0.5013	0.4881	0.4773	0.4873	0.5096	0.5508	0.6466	0.5587
54	0.5313	0.5068	0.4978	0.4839	0.4719	0.4809	0.5022	0.5428	0.6372	0.5501
55	0.5417	0.5032	0.4936	0.4789	0.4656	0.4733	0.4931	0.5327	0.6254	0.5392
56	0.5521	0.4996	0.4895	0.4739	0.4593	0.4657	0.4839	0.5226	0.6136	0.5283
57	0.5625	0.4929	0.4817	0.4646	0.4477	0.4519	0.4682	0.5056	0.5939	0.5102
58	0.5729	0.4859	0.4737	0.4550	0.4360	0.4383	0.4528	0.4890	0.5748	0.4927
59	0.5833	0.4799	0.4669	0.4471	0.4264	0.4274	0.4407	0.4762	0.5599	0.4793
60	0.5938	0.4729	0.4591	0.4380	0.4156	0.4150	0.4268	0.4613	0.5425	0.4636
61	0.6042	0.4646	0.4497	0.4274	0.4031	0.4007	0.4105	0.4435	0.5217	0.4449
62	0.6146	0.4602	0.4451	0.4220	0.3968	0.3945	0.4047	0.4385	0.5159	0.4400
63	0.6250	0.4568	0.4415	0.4180	0.3922	0.3900	0.4009	0.4353	0.5123	0.4371
64	0.6354	0.4511	0.4351	0.4108	0.3841	0.3805	0.3897	0.4227	0.4976	0.4239
65	0.6458	0.4455	0.4287	0.4037	0.3760	0.3709	0.3784	0.4101	0.4829	0.4107
66	0.6563	0.4385	0.4209	0.3950	0.3664	0.3600	0.3662	0.3968	0.4673	0.3971
67	0.6667	0.4296	0.4110	0.3840	0.3540	0.3457	0.3495	0.3782	0.4455	0.3777
68	0.6771	0.4257	0.4067	0.3793	0.3488	0.3401	0.3437	0.3722	0.4387	0.3719
69	0.6875	0.4218	0.4024	0.3745	0.3435	0.3344	0.3379	0.3662	0.4318	0.3661
70	0.6979	0.4179	0.3982	0.3699	0.3385	0.3290	0.3322	0.3603	0.4249	0.3603
71	0.7083	0.4119	0.3917	0.3628	0.3307	0.3206	0.3236	0.3517	0.4151	0.3519
72	0.7188	0.4059	0.3852	0.3556	0.3227	0.3121	0.3150	0.3430	0.4053	0.3435
73	0.7292	0.3993	0.3781	0.3480	0.3146	0.3033	0.3055	0.3329	0.3934	0.3336
74	0.7396	0.3913	0.3694	0.3387	0.3049	0.2929	0.2946	0.3214	0.3798	0.3225
75	0.7500	0.3795	0.3565	0.3249	0.2903	0.2763	0.2759	0.3007	0.3553	0.3023
76	0.7604	0.3675	0.3434	0.3109	0.2754	0.2597	0.2573	0.2801	0.3308	0.2820
77	0.7708	0.3555	0.3304	0.2969	0.2606	0.2430	0.2386	0.2595	0.3063	0.2617
78	0.7812	0.3374	0.3109	0.2766	0.2399	0.2201	0.2127	0.2305	0.2712	0.2332
79	0.7917	0.3187	0.2909	0.2560	0.2190	0.1973	0.1869	0.2017	0.2362	0.2050
80	0.8021	0.2991	0.2704	0.2351	0.1983	0.1749	0.1614	0.1729	0.2007	0.1769
81	0.8125	0.2796	0.2498	0.2141	0.1775	0.1524	0.1359	0.1441	0.1653	0.1487
82	0.8229	0.2660	0.2353	0.1993	0.1629	0.1360	0.1165	0.1216	0.1373	0.1267
83	0.8333	0.2539	0.2223	0.1861	0.1497	0.1210	0.0986	0.1007	0.1110	0.1062
84	0.8437	0.2377	0.2055	0.1692	0.1332	0.1033	0.0787	0.0782	0.0828	0.0850
85	0.8542	0.2325	0.2002	0.1638	0.1280	0.0981	0.0737	0.0733	0.0765	0.0813
86	0.8646	0.2272	0.1949	0.1585	0.1229	0.0930	0.0688	0.0685	0.0703	0.0778
87	0.8750	0.2212	0.1888	0.1524	0.1169	0.0869	0.0628	0.0624	0.0627	0.0730
88	0.8854	0.2127	0.1800	0.1435	0.1083	0.0778	0.0532	0.0524	0.0502	0.0645
89	0.8958	0.2057	0.1728	0.1363	0.1014	0.0707	0.0458	0.0446	0.0400	0.0581
90	0.9062	0.1968	0.1636	0.1270	0.0923	0.0608	0.0349	0.0327	0.0252	0.0475
91	0.9167	0.1909	0.1575	0.1209	0.0863	0.0545	0.0282	0.0256	0.0157	0.0418
92	0.9271	0.1859	0.1525	0.1157	0.0812	0.0495	0.0235	0.0214	0.0092	0.0392
93	0.9375	0.1816	0.1482	0.1114	0.0769	0.0455	0.0204	0.0194	0.0061	0.0392
94	0.9479	0.1770	0.1437	0.1067	0.0721	0.0412	0.0176	0.0182	0.0040	0.0407
95	0.9583	0.1724	0.1392	0.1020	0.0673	0.0369	0.0147	0.0171	0.0019	0.0421
96	0.9687	0.1679	0.1347	0.0973	0.0626	0.0327	0.0119	0.0160	0.0000	0.0434
97	0.9792	0.1656	0.1324	0.0949	0.0601	0.0306	0.0108	0.0162	0.0000	0.0451
98	0.9896	0.1644	0.1312	0.0936	0.0587	0.0295	0.0106	0.0170	0.0010	0.0469
99	1.0000	0.1631	0.1300	0.0923	0.0572	0.0284	0.0105	0.0179	0.0019	0.0487
100										
101										

d56_k06ss3sc10

-1		1.1583	0.71388	0.44442							
		Upleg velocity (m/s)									
Point no.	y/D	4.5	4.2	3.6	3.6	3.2	3.1	2.7	1.5	2.1	3.8
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	0.0000	0.9851	0.9798	0.9823	0.9692	0.9328	0.9156	0.9083	0.7139	0.8288	1.0176
4	0.0104	0.9849	0.9797	0.9825	0.9695	0.9334	0.9165	0.9098	0.7176	0.8316	1.0177
5	0.0208	0.9848	0.9797	0.9828	0.9700	0.9342	0.9175	0.9114	0.7212	0.8344	1.0178
6	0.0313	0.9847	0.9796	0.9831	0.9704	0.9349	0.9185	0.9129	0.7249	0.8372	1.0179
7	0.0417	0.9846	0.9796	0.9833	0.9709	0.9357	0.9195	0.9145	0.7288	0.8401	1.0181
8	0.0521	0.9836	0.9786	0.9825	0.9702	0.9353	0.9194	0.9151	0.7325	0.8423	1.0172
9	0.0625	0.9842	0.9794	0.9838	0.9722	0.9383	0.9229	0.9197	0.7429	0.8494	1.0183
10	0.0729	0.9852	0.9807	0.9857	0.9748	0.9421	0.9275	0.9253	0.7550	0.8578	1.0200
11	0.0833	0.9861	0.9818	0.9874	0.9772	0.9458	0.9317	0.9307	0.7665	0.8657	1.0216
12	0.0938	0.9864	0.9824	0.9884	0.9789	0.9485	0.9351	0.9350	0.7770	0.8726	1.0224
13	0.1042	0.9873	0.9835	0.9901	0.9815	0.9526	0.9399	0.9411	0.7904	0.8818	1.0240
14	0.1146	0.9881	0.9847	0.9918	0.9841	0.9566	0.9447	0.9471	0.8039	0.8911	1.0256
15	0.1250	0.9894	0.9863	0.9938	0.9871	0.9613	0.9502	0.9536	0.8177	0.9009	1.0276
16	0.1354	0.9903	0.9874	0.9954	0.9895	0.9652	0.9548	0.9593	0.8300	0.9097	1.0291
17	0.1458	0.9904	0.9876	0.9958	0.9904	0.9671	0.9572	0.9623	0.8371	0.9147	1.0295
18	0.1563	0.9895	0.9867	0.9950	0.9901	0.9676	0.9580	0.9639	0.8423	0.9181	1.0288
19	0.1667	0.9899	0.9873	0.9959	0.9916	0.9702	0.9612	0.9678	0.8513	0.9243	1.0296
20	0.1771	0.9925	0.9904	0.9995	0.9962	0.9765	0.9683	0.9758	0.8670	0.9354	1.0330
21	0.1875	0.9924	0.9903	0.9996	0.9967	0.9779	0.9700	0.9781	0.8732	0.9395	1.0331
22	0.1979	0.9908	0.9887	0.9979	0.9953	0.9769	0.9693	0.9778	0.8751	0.9405	1.0316
23	0.2083	0.9893	0.9870	0.9962	0.9938	0.9759	0.9685	0.9775	0.8770	0.9415	1.0300
24	0.2188	0.9878	0.9854	0.9946	0.9923	0.9749	0.9677	0.9771	0.8789	0.9425	1.0284
25	0.2292	0.9839	0.9811	0.9900	0.9876	0.9706	0.9635	0.9734	0.8768	0.9401	1.0241
26	0.2396	0.9759	0.9723	0.9807	0.9780	0.9612	0.9542	0.9649	0.8714	0.9338	1.0154
27	0.2500	0.9630	0.9579	0.9652	0.9613	0.9436	0.9361	0.9473	0.8514	0.9167	1.0007
28	0.2604	0.9521	0.9458	0.9523	0.9475	0.9292	0.9214	0.9331	0.8360	0.9032	0.9885
29	0.2708	0.9483	0.9417	0.9481	0.9432	0.9252	0.9175	0.9298	0.8355	0.9013	0.9845
30	0.2813	0.9487	0.9422	0.9488	0.9444	0.9274	0.9202	0.9331	0.8439	0.9066	0.9852
31	0.2917	0.9522	0.9463	0.9530	0.9496	0.9343	0.9279	0.9413	0.8603	0.9183	0.9891
32	0.3021	0.9567	0.9516	0.9585	0.9560	0.9428	0.9374	0.9513	0.8793	0.9319	0.9941
33	0.3125	0.9613	0.9568	0.9640	0.9624	0.9513	0.9468	0.9612	0.8984	0.9456	0.9992
34	0.3229	0.9669	0.9634	0.9710	0.9709	0.9629	0.9599	0.9753	0.9266	0.9654	1.0057
35	0.3333	0.9734	0.9711	0.9792	0.9808	0.9766	0.9754	0.9921	0.9608	0.9892	1.0133
36	0.3438	0.9794	0.9777	0.9856	0.9877	0.9850	0.9844	1.0007	0.9740	0.9999	1.0192
37	0.3542	0.9865	0.9856	0.9935	0.9962	0.9954	0.9956	1.0118	0.9913	1.0136	1.0265
38	0.3646	0.9936	0.9935	1.0014	1.0048	1.0058	1.0069	1.0228	1.0086	1.0273	1.0338
39	0.3750	1.0006	1.0014	1.0093	1.0133	1.0162	1.0181	1.0339	1.0259	1.0410	1.0410
40	0.3854	1.0077	1.0093	1.0172	1.0219	1.0267	1.0294	1.0450	1.0433	1.0547	1.0483
41	0.3958	1.0114	1.0134	1.0212	1.0262	1.0320	1.0351	1.0505	1.0517	1.0615	1.0521
42	0.4063	1.0128	1.0150	1.0226	1.0275	1.0336	1.0368	1.0520	1.0535	1.0632	1.0533
43	0.4167	1.0134	1.0157	1.0231	1.0278	1.0341	1.0374	1.0524	1.0538	1.0636	1.0537
44	0.4271	1.0141	1.0164	1.0234	1.0277	1.0343	1.0376	1.0522	1.0528	1.0631	1.0540
45	0.4375	1.0132	1.0154	1.0219	1.0256	1.0322	1.0354	1.0496	1.0484	1.0599	1.0526
46	0.4479	1.0135	1.0156	1.0216	1.0248	1.0315	1.0346	1.0483	1.0456	1.0581	1.0523
47	0.4583	1.0126	1.0145	1.0200	1.0225	1.0292	1.0321	1.0452	1.0400	1.0542	1.0507
48	0.4688	1.0129	1.0148	1.0197	1.0217	1.0283	1.0312	1.0438	1.0366	1.0521	1.0504

49	0.4792	1.0160	1.0181	1.0227	1.0244	1.0312	1.0341	1.0461	1.0377	1.0539	1.0532
50	0.4896	1.0175	1.0196	1.0240	1.0254	1.0322	1.0351	1.0467	1.0371	1.0541	1.0544
51	0.5000	1.0184	1.0206	1.0247	1.0259	1.0328	1.0355	1.0468	1.0362	1.0538	1.0551
52	0.5104	1.0209	1.0232	1.0273	1.0284	1.0354	1.0382	1.0492	1.0383	1.0562	1.0575
53	0.5208	1.0230	1.0254	1.0294	1.0306	1.0376	1.0404	1.0512	1.0400	1.0580	1.0595
54	0.5313	1.0254	1.0280	1.0319	1.0331	1.0402	1.0430	1.0535	1.0421	1.0602	1.0619
55	0.5417	1.0279	1.0306	1.0346	1.0359	1.0430	1.0458	1.0562	1.0448	1.0629	1.0644
56	0.5521	1.0305	1.0333	1.0374	1.0388	1.0458	1.0487	1.0588	1.0475	1.0656	1.0670
57	0.5625	1.0337	1.0368	1.0409	1.0424	1.0495	1.0524	1.0624	1.0511	1.0691	1.0703
58	0.5729	1.0387	1.0420	1.0462	1.0480	1.0551	1.0581	1.0677	1.0567	1.0744	1.0753
59	0.5833	1.0423	1.0459	1.0501	1.0521	1.0592	1.0622	1.0716	1.0605	1.0782	1.0790
60	0.5938	1.0468	1.0506	1.0548	1.0569	1.0639	1.0669	1.0759	1.0645	1.0824	1.0834
61	0.6042	1.0513	1.0553	1.0595	1.0617	1.0687	1.0716	1.0802	1.0685	1.0865	1.0879
62	0.6146	1.0542	1.0583	1.0626	1.0649	1.0718	1.0747	1.0831	1.0710	1.0892	1.0908
63	0.6250	1.0568	1.0611	1.0654	1.0677	1.0745	1.0775	1.0856	1.0733	1.0916	1.0934
64	0.6354	1.0598	1.0641	1.0685	1.0709	1.0776	1.0805	1.0885	1.0762	1.0944	1.0963
65	0.6458	1.0630	1.0674	1.0717	1.0742	1.0808	1.0837	1.0913	1.0788	1.0971	1.0994
66	0.6563	1.0661	1.0706	1.0749	1.0774	1.0838	1.0866	1.0939	1.0810	1.0995	1.1023
67	0.6667	1.0688	1.0734	1.0777	1.0803	1.0866	1.0893	1.0965	1.0835	1.1021	1.1050
68	0.6771	1.0712	1.0759	1.0802	1.0829	1.0891	1.0918	1.0988	1.0858	1.1044	1.1073
69	0.6875	1.0722	1.0770	1.0813	1.0840	1.0901	1.0929	1.0998	1.0867	1.1054	1.1083
70	0.6979	1.0739	1.0787	1.0830	1.0858	1.0918	1.0945	1.1013	1.0881	1.1069	1.1100
71	0.7083	1.0758	1.0806	1.0850	1.0878	1.0937	1.0964	1.1031	1.0898	1.1086	1.1118
72	0.7188	1.0788	1.0837	1.0880	1.0909	1.0965	1.0991	1.1056	1.0925	1.1111	1.1146
73	0.7292	1.0823	1.0871	1.0913	1.0943	1.0996	1.1021	1.1082	1.0954	1.1138	1.1177
74	0.7396	1.0852	1.0900	1.0942	1.0972	1.1023	1.1047	1.1106	1.0980	1.1163	1.1203
75	0.7500	1.0883	1.0932	1.0973	1.1004	1.1052	1.1075	1.1132	1.1008	1.1189	1.1232
76	0.7604	1.0914	1.0963	1.1005	1.1036	1.1081	1.1103	1.1159	1.1036	1.1216	1.1261
77	0.7708	1.0956	1.1005	1.1046	1.1077	1.1119	1.1140	1.1192	1.1072	1.1250	1.1299
78	0.7812	1.1007	1.1056	1.1096	1.1127	1.1164	1.1183	1.1230	1.1116	1.1290	1.1345
79	0.7917	1.1041	1.1089	1.1128	1.1159	1.1192	1.1209	1.1253	1.1145	1.1314	1.1374
80	0.8021	1.1080	1.1126	1.1163	1.1193	1.1222	1.1237	1.1277	1.1180	1.1341	1.1406
81	0.8125	1.1120	1.1165	1.1200	1.1229	1.1253	1.1266	1.1302	1.1218	1.1369	1.1439
82	0.8229	1.1152	1.1196	1.1228	1.1257	1.1276	1.1288	1.1321	1.1247	1.1389	1.1465
83	0.8333	1.1170	1.1213	1.1245	1.1273	1.1290	1.1301	1.1331	1.1266	1.1402	1.1480
84	0.8437	1.1183	1.1226	1.1257	1.1284	1.1300	1.1310	1.1340	1.1281	1.1412	1.1490
85	0.8542	1.1190	1.1232	1.1262	1.1290	1.1305	1.1316	1.1345	1.1290	1.1418	1.1495
86	0.8646	1.1195	1.1237	1.1267	1.1295	1.1310	1.1320	1.1349	1.1300	1.1424	1.1500
87	0.8750	1.1205	1.1247	1.1277	1.1305	1.1319	1.1329	1.1357	1.1315	1.1434	1.1508
88	0.8854	1.1213	1.1255	1.1284	1.1313	1.1326	1.1336	1.1363	1.1330	1.1443	1.1515
89	0.8958	1.1218	1.1260	1.1289	1.1319	1.1332	1.1342	1.1369	1.1344	1.1451	1.1520
90	0.9062	1.1223	1.1265	1.1295	1.1325	1.1338	1.1348	1.1374	1.1357	1.1460	1.1524
91	0.9167	1.1229	1.1271	1.1300	1.1331	1.1344	1.1354	1.1380	1.1370	1.1468	1.1529
92	0.9271	1.1234	1.1277	1.1306	1.1338	1.1353	1.1364	1.1389	1.1389	1.1480	1.1535
93	0.9375	1.1238	1.1281	1.1311	1.1345	1.1360	1.1372	1.1397	1.1405	1.1491	1.1539
94	0.9479	1.1242	1.1286	1.1316	1.1351	1.1366	1.1379	1.1404	1.1421	1.1501	1.1544
95	0.9583	1.1244	1.1289	1.1321	1.1358	1.1376	1.1389	1.1415	1.1441	1.1516	1.1548
96	0.9687	1.1246	1.1292	1.1325	1.1366	1.1386	1.1400	1.1427	1.1463	1.1533	1.1552
97	0.9792	1.1250	1.1297	1.1331	1.1375	1.1396	1.1412	1.1439	1.1486	1.1550	1.1558
98	0.9896	1.1253	1.1301	1.1338	1.1384	1.1407	1.1424	1.1452	1.1509	1.1568	1.1564
99	1.0000	1.1258	1.1307	1.1345	1.1393	1.1418	1.1435	1.1463	1.1529	1.1583	1.1570
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		1.1583	0.71388	0.44442							
		Upleg velocity (m/s). Normalised conductivities									
Point no.	y/D	4.5	4.2	3.6	3.6	3.2	3.1	2.7	1.5	2.1	3.8
1											
2											
3	0.0000	0.3897	0.4017	0.3960	0.4255	0.5074	0.5460	0.5626	1.0000	0.7415	0.3166
4	0.0104	0.3901	0.4019	0.3955	0.4247	0.5060	0.5440	0.5592	0.9917	0.7352	0.3164
5	0.0208	0.3903	0.4020	0.3949	0.4237	0.5043	0.5418	0.5556	0.9835	0.7288	0.3161
6	0.0313	0.3905	0.4020	0.3943	0.4228	0.5027	0.5396	0.5521	0.9753	0.7224	0.3159
7	0.0417	0.3908	0.4021	0.3937	0.4218	0.5010	0.5373	0.5485	0.9664	0.7159	0.3155
8	0.0521	0.3930	0.4045	0.3955	0.4232	0.5018	0.5376	0.5472	0.9581	0.7111	0.3175
9	0.0625	0.3917	0.4027	0.3926	0.4188	0.4951	0.5296	0.5369	0.9348	0.6951	0.3150
10	0.0729	0.3895	0.3997	0.3884	0.4129	0.4864	0.5194	0.5242	0.9076	0.6763	0.3112
11	0.0833	0.3874	0.3971	0.3845	0.4074	0.4783	0.5098	0.5122	0.8816	0.6583	0.3076
12	0.0938	0.3868	0.3959	0.3823	0.4037	0.4721	0.5023	0.5024	0.8581	0.6429	0.3058
13	0.1042	0.3848	0.3933	0.3785	0.3979	0.4629	0.4914	0.4888	0.8278	0.6221	0.3022
14	0.1146	0.3829	0.3907	0.3747	0.3921	0.4538	0.4806	0.4753	0.7975	0.6013	0.2986
15	0.1250	0.3800	0.3871	0.3701	0.3852	0.4433	0.4683	0.4605	0.7665	0.5792	0.2941
16	0.1354	0.3780	0.3845	0.3665	0.3798	0.4344	0.4578	0.4477	0.7388	0.5595	0.2907
17	0.1458	0.3779	0.3841	0.3656	0.3777	0.4302	0.4526	0.4410	0.7226	0.5482	0.2898
18	0.1563	0.3798	0.3861	0.3674	0.3785	0.4292	0.4507	0.4375	0.7111	0.5405	0.2914
19	0.1667	0.3789	0.3848	0.3654	0.3752	0.4233	0.4436	0.4287	0.6908	0.5265	0.2896
20	0.1771	0.3730	0.3778	0.3573	0.3647	0.4091	0.4276	0.4107	0.6554	0.5016	0.2819
21	0.1875	0.3733	0.3779	0.3571	0.3635	0.4060	0.4237	0.4055	0.6416	0.4923	0.2817
22	0.1979	0.3768	0.3816	0.3609	0.3669	0.4083	0.4254	0.4062	0.6373	0.4901	0.2851
23	0.2083	0.3803	0.3854	0.3647	0.3703	0.4105	0.4271	0.4069	0.6330	0.4879	0.2887
24	0.2188	0.3837	0.3891	0.3685	0.3736	0.4127	0.4289	0.4077	0.6287	0.4857	0.2923
25	0.2292	0.3924	0.3987	0.3787	0.3841	0.4225	0.4383	0.4161	0.6335	0.4909	0.3020
26	0.2396	0.4104	0.4185	0.3996	0.4056	0.4435	0.4593	0.4352	0.6456	0.5052	0.3215
27	0.2500	0.4395	0.4510	0.4345	0.4433	0.4831	0.4999	0.4747	0.6905	0.5435	0.3546
28	0.2604	0.4639	0.4782	0.4635	0.4743	0.5154	0.5331	0.5067	0.7253	0.5741	0.3821
29	0.2708	0.4726	0.4875	0.4731	0.4840	0.5245	0.5418	0.5141	0.7264	0.5784	0.3911
30	0.2813	0.4717	0.4862	0.4715	0.4812	0.5195	0.5358	0.5068	0.7075	0.5663	0.3896
31	0.2917	0.4638	0.4770	0.4619	0.4697	0.5040	0.5184	0.4882	0.6706	0.5401	0.3807
32	0.3021	0.4536	0.4652	0.4496	0.4553	0.4849	0.4971	0.4658	0.6277	0.5093	0.3694
33	0.3125	0.4433	0.4534	0.4373	0.4409	0.4658	0.4759	0.4435	0.5848	0.4785	0.3581
34	0.3229	0.4307	0.4385	0.4215	0.4218	0.4398	0.4465	0.4118	0.5213	0.4340	0.3434
35	0.3333	0.4160	0.4212	0.4031	0.3993	0.4088	0.4116	0.3740	0.4445	0.3805	0.3263
36	0.3438	0.4025	0.4063	0.3886	0.3840	0.3901	0.3914	0.3546	0.4148	0.3564	0.3130
37	0.3542	0.3866	0.3886	0.3708	0.3647	0.3666	0.3661	0.3296	0.3758	0.3256	0.2966
38	0.3646	0.3707	0.3708	0.3530	0.3454	0.3431	0.3407	0.3049	0.3368	0.2948	0.2801
39	0.3750	0.3548	0.3530	0.3353	0.3263	0.3197	0.3155	0.2799	0.2979	0.2639	0.2639
40	0.3854	0.3389	0.3353	0.3175	0.3069	0.2961	0.2900	0.2549	0.2588	0.2331	0.2475
41	0.3958	0.3305	0.3260	0.3085	0.2972	0.2842	0.2772	0.2426	0.2399	0.2178	0.2390
42	0.4063	0.3274	0.3224	0.3053	0.2943	0.2806	0.2734	0.2392	0.2358	0.2140	0.2363
43	0.4167	0.3260	0.3209	0.3042	0.2936	0.2795	0.2720	0.2383	0.2351	0.2131	0.2354
44	0.4271	0.3245	0.3193	0.3035	0.2939	0.2790	0.2716	0.2387	0.2374	0.2142	0.2347
45	0.4375	0.3265	0.3215	0.3069	0.2986	0.2837	0.2765	0.2446	0.2473	0.2214	0.2378
46	0.4479	0.3258	0.3211	0.3076	0.3004	0.2853	0.2783	0.2475	0.2536	0.2255	0.2385
47	0.4583	0.3278	0.3236	0.3112	0.3056	0.2905	0.2840	0.2545	0.2662	0.2342	0.2421
48	0.4688	0.3272	0.3229	0.3119	0.3074	0.2925	0.2860	0.2576	0.2738	0.2390	0.2428
49	0.4792	0.3202	0.3155	0.3051	0.3013	0.2860	0.2795	0.2525	0.2714	0.2349	0.2365
50	0.4896	0.3168	0.3121	0.3022	0.2990	0.2837	0.2772	0.2511	0.2727	0.2345	0.2338

51	0.5000	0.3148	0.3098	0.3006	0.2979	0.2824	0.2763	0.2509	0.2747	0.2351	0.2322
52	0.5104	0.3092	0.3040	0.2948	0.2923	0.2765	0.2702	0.2455	0.2700	0.2297	0.2268
53	0.5208	0.3044	0.2990	0.2900	0.2873	0.2716	0.2653	0.2410	0.2662	0.2257	0.2223
54	0.5313	0.2990	0.2932	0.2844	0.2817	0.2657	0.2594	0.2358	0.2615	0.2207	0.2169
55	0.5417	0.2934	0.2873	0.2783	0.2754	0.2594	0.2531	0.2297	0.2554	0.2147	0.2113
56	0.5521	0.2876	0.2813	0.2720	0.2689	0.2531	0.2466	0.2239	0.2493	0.2086	0.2054
57	0.5625	0.2804	0.2734	0.2642	0.2608	0.2448	0.2383	0.2158	0.2412	0.2007	0.1980
58	0.5729	0.2691	0.2617	0.2522	0.2482	0.2322	0.2255	0.2039	0.2286	0.1888	0.1868
59	0.5833	0.2610	0.2529	0.2435	0.2390	0.2230	0.2162	0.1951	0.2201	0.1802	0.1784
60	0.5938	0.2509	0.2423	0.2329	0.2282	0.2124	0.2057	0.1854	0.2111	0.1708	0.1685
61	0.6042	0.2408	0.2318	0.2223	0.2174	0.2016	0.1951	0.1757	0.2021	0.1616	0.1584
62	0.6146	0.2342	0.2250	0.2153	0.2102	0.1946	0.1881	0.1692	0.1964	0.1555	0.1519
63	0.6250	0.2284	0.2187	0.2090	0.2039	0.1886	0.1818	0.1636	0.1913	0.1501	0.1460
64	0.6354	0.2216	0.2120	0.2021	0.1967	0.1816	0.1751	0.1571	0.1847	0.1438	0.1395
65	0.6458	0.2144	0.2045	0.1949	0.1892	0.1744	0.1679	0.1508	0.1789	0.1377	0.1325
66	0.6563	0.2075	0.1973	0.1877	0.1820	0.1676	0.1613	0.1449	0.1739	0.1323	0.1260
67	0.6667	0.2014	0.1910	0.1814	0.1755	0.1613	0.1553	0.1391	0.1683	0.1265	0.1199
68	0.6771	0.1960	0.1854	0.1757	0.1697	0.1557	0.1496	0.1339	0.1631	0.1213	0.1148
69	0.6875	0.1937	0.1829	0.1733	0.1672	0.1535	0.1472	0.1316	0.1611	0.1190	0.1125
70	0.6979	0.1899	0.1791	0.1694	0.1631	0.1496	0.1436	0.1283	0.1580	0.1157	0.1087
71	0.7083	0.1856	0.1748	0.1649	0.1586	0.1454	0.1393	0.1242	0.1541	0.1118	0.1046
72	0.7188	0.1789	0.1679	0.1582	0.1517	0.1391	0.1332	0.1186	0.1481	0.1062	0.0983
73	0.7292	0.1710	0.1602	0.1508	0.1440	0.1321	0.1265	0.1127	0.1415	0.1001	0.0914
74	0.7396	0.1645	0.1537	0.1442	0.1375	0.1260	0.1206	0.1073	0.1357	0.0945	0.0855
75	0.7500	0.1575	0.1465	0.1373	0.1303	0.1195	0.1143	0.1015	0.1294	0.0887	0.0790
76	0.7604	0.1505	0.1395	0.1301	0.1231	0.1130	0.1080	0.0954	0.1231	0.0826	0.0725
77	0.7708	0.1411	0.1301	0.1208	0.1139	0.1044	0.0997	0.0880	0.1150	0.0749	0.0639
78	0.7812	0.1296	0.1186	0.1096	0.1026	0.0943	0.0900	0.0794	0.1051	0.0659	0.0536
79	0.7917	0.1220	0.1112	0.1024	0.0954	0.0880	0.0842	0.0743	0.0986	0.0605	0.0470
80	0.8021	0.1132	0.1028	0.0945	0.0878	0.0812	0.0779	0.0689	0.0907	0.0545	0.0398
81	0.8125	0.1042	0.0941	0.0862	0.0797	0.0743	0.0713	0.0632	0.0821	0.0482	0.0324
82	0.8229	0.0970	0.0871	0.0799	0.0734	0.0691	0.0664	0.0590	0.0756	0.0437	0.0266
83	0.8333	0.0929	0.0833	0.0761	0.0698	0.0659	0.0635	0.0567	0.0713	0.0407	0.0232
84	0.8437	0.0900	0.0803	0.0734	0.0673	0.0637	0.0614	0.0547	0.0680	0.0385	0.0209
85	0.8542	0.0884	0.0790	0.0722	0.0659	0.0626	0.0601	0.0536	0.0659	0.0371	0.0198
86	0.8646	0.0873	0.0779	0.0711	0.0648	0.0614	0.0592	0.0527	0.0637	0.0358	0.0187
87	0.8750	0.0851	0.0756	0.0689	0.0626	0.0594	0.0572	0.0509	0.0603	0.0335	0.0169
88	0.8854	0.0833	0.0738	0.0673	0.0608	0.0578	0.0556	0.0495	0.0569	0.0315	0.0153
89	0.8958	0.0821	0.0727	0.0662	0.0594	0.0565	0.0542	0.0482	0.0538	0.0297	0.0142
90	0.9062	0.0810	0.0716	0.0648	0.0581	0.0551	0.0529	0.0470	0.0509	0.0277	0.0133
91	0.9167	0.0797	0.0702	0.0637	0.0567	0.0538	0.0515	0.0457	0.0479	0.0259	0.0122
92	0.9271	0.0785	0.0689	0.0623	0.0551	0.0518	0.0493	0.0437	0.0437	0.0232	0.0108
93	0.9375	0.0776	0.0680	0.0612	0.0536	0.0502	0.0475	0.0419	0.0401	0.0207	0.0099
94	0.9479	0.0767	0.0668	0.0601	0.0522	0.0488	0.0459	0.0403	0.0365	0.0185	0.0088
95	0.9583	0.0763	0.0662	0.0590	0.0506	0.0466	0.0437	0.0378	0.0320	0.0151	0.0079
96	0.9687	0.0758	0.0655	0.0581	0.0488	0.0443	0.0412	0.0351	0.0270	0.0113	0.0070
97	0.9792	0.0749	0.0644	0.0567	0.0468	0.0421	0.0385	0.0324	0.0218	0.0074	0.0056
98	0.9896	0.0743	0.0635	0.0551	0.0448	0.0396	0.0358	0.0295	0.0167	0.0034	0.0043
99	1.0000	0.0731	0.0621	0.0536	0.0428	0.0371	0.0333	0.0270	0.0122	0.0000	0.0029
100											
101											

d56_k06ss3sc20

-1		0.99637	-.35748	1.35385						
		Upleg velocity (m/s)								
Point no.	y/D	3.6	2.9	2.6	2.3	1.8	1.3	2.2	3.3	3.8
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	0.0000	0.4247	0.3747	0.3286	0.2992	0.1892	-0.3575	0.2869	0.4487	0.5097
4	0.0104	0.4220	0.3728	0.3269	0.2979	0.1885	-0.3545	0.2858	0.4463	0.5071
5	0.0208	0.4195	0.3712	0.3256	0.2968	0.1880	-0.3512	0.2850	0.4441	0.5048
6	0.0313	0.4171	0.3696	0.3242	0.2956	0.1876	-0.3479	0.2841	0.4419	0.5026
7	0.0417	0.4146	0.3680	0.3228	0.2945	0.1871	-0.3446	0.2832	0.4397	0.5003
8	0.0521	0.4102	0.3645	0.3197	0.2918	0.1850	-0.3422	0.2807	0.4357	0.4960
9	0.0625	0.4096	0.3657	0.3210	0.2933	0.1880	-0.3277	0.2826	0.4356	0.4950
10	0.0729	0.4100	0.3681	0.3235	0.2960	0.1924	-0.3102	0.2857	0.4367	0.4949
11	0.0833	0.4102	0.3701	0.3255	0.2982	0.1963	-0.2939	0.2884	0.4374	0.4945
12	0.0938	0.4089	0.3705	0.3260	0.2988	0.1985	-0.2797	0.2893	0.4366	0.4928
13	0.1042	0.4101	0.3740	0.3296	0.3026	0.2040	-0.2577	0.2935	0.4386	0.4930
14	0.1146	0.4113	0.3775	0.3332	0.3063	0.2095	-0.2356	0.2976	0.4405	0.4932
15	0.1250	0.4147	0.3833	0.3392	0.3123	0.2173	-0.2099	0.3039	0.4447	0.4953
16	0.1354	0.4178	0.3887	0.3449	0.3180	0.2245	-0.1856	0.3099	0.4487	0.4972
17	0.1458	0.4183	0.3906	0.3469	0.3200	0.2276	-0.1716	0.3122	0.4497	0.4969
18	0.1563	0.4166	0.3901	0.3465	0.3197	0.2280	-0.1608	0.3120	0.4485	0.4945
19	0.1667	0.4185	0.3936	0.3503	0.3235	0.2330	-0.1432	0.3161	0.4509	0.4952
20	0.1771	0.4265	0.4041	0.3610	0.3344	0.2460	-0.1143	0.3274	0.4596	0.5015
21	0.1875	0.4271	0.4059	0.3631	0.3366	0.2491	-0.1016	0.3298	0.4607	0.5013
22	0.1979	0.4240	0.4035	0.3609	0.3345	0.2475	-0.0963	0.3279	0.4580	0.4976
23	0.2083	0.4209	0.4011	0.3588	0.3325	0.2459	-0.0910	0.3260	0.4553	0.4940
24	0.2188	0.4177	0.3987	0.3567	0.3304	0.2443	-0.0857	0.3241	0.4526	0.4904
25	0.2292	0.4103	0.3918	0.3504	0.3244	0.2385	-0.0842	0.3183	0.4458	0.4823
26	0.2396	0.3919	0.3739	0.3341	0.3091	0.2240	-0.0908	0.3036	0.4283	0.4633
27	0.2500	0.3598	0.3404	0.3017	0.2772	0.1909	-0.1232	0.2720	0.3969	0.4320
28	0.2604	0.3322	0.3117	0.2740	0.2500	0.1629	-0.1505	0.2452	0.3698	0.4051
29	0.2708	0.3218	0.3016	0.2645	0.2412	0.1548	-0.1551	0.2367	0.3599	0.3945
30	0.2813	0.3244	0.3057	0.2694	0.2467	0.1622	-0.1390	0.2428	0.3632	0.3957
31	0.2917	0.3391	0.3231	0.2887	0.2672	0.1865	-0.0994	0.2643	0.3791	0.4071
32	0.3021	0.3579	0.3451	0.3127	0.2927	0.2164	-0.0519	0.2909	0.3992	0.4219
33	0.3125	0.3767	0.3670	0.3368	0.3182	0.2463	-0.0045	0.3176	0.4193	0.4367
34	0.3229	0.3992	0.3941	0.3667	0.3501	0.2845	0.0588	0.3512	0.4438	0.4539
35	0.3333	0.4249	0.4251	0.4011	0.3869	0.3289	0.1331	0.3901	0.4719	0.4731
36	0.3438	0.4489	0.4512	0.4292	0.4162	0.3621	0.1791	0.4205	0.4969	0.4932
37	0.3542	0.4754	0.4803	0.4605	0.4486	0.3988	0.2311	0.4539	0.5246	0.5154
38	0.3646	0.5019	0.5094	0.4918	0.4811	0.4354	0.2831	0.4874	0.5523	0.5376
39	0.3750	0.5285	0.5386	0.5230	0.5135	0.4721	0.3351	0.5209	0.5799	0.5599
40	0.3854	0.5550	0.5677	0.5543	0.5460	0.5088	0.3871	0.5544	0.6076	0.5821
41	0.3958	0.5692	0.5831	0.5709	0.5633	0.5284	0.4145	0.5723	0.6225	0.5939
42	0.4063	0.5744	0.5885	0.5768	0.5693	0.5352	0.4234	0.5786	0.6281	0.5981
43	0.4167	0.5771	0.5910	0.5797	0.5723	0.5387	0.4278	0.5819	0.6310	0.6001
44	0.4271	0.5792	0.5923	0.5814	0.5739	0.5406	0.4296	0.5837	0.6334	0.6014
45	0.4375	0.5761	0.5878	0.5770	0.5692	0.5355	0.4221	0.5792	0.6305	0.5980
46	0.4479	0.5771	0.5878	0.5775	0.5696	0.5361	0.4216	0.5798	0.6319	0.5985
47	0.4583	0.5735	0.5824	0.5722	0.5639	0.5297	0.4119	0.5743	0.6285	0.5947
48	0.4688	0.5741	0.5818	0.5718	0.5632	0.5289	0.4093	0.5738	0.6293	0.5948
49	0.4792	0.5847	0.5921	0.5828	0.5742	0.5407	0.4225	0.5850	0.6402	0.6043

50	0.4896	0.5892	0.5959	0.5870	0.5782	0.5448	0.4263	0.5891	0.6448	0.6081
51	0.5000	0.5920	0.5981	0.5894	0.5805	0.5471	0.4280	0.5915	0.6479	0.6104
52	0.5104	0.5999	0.6061	0.5979	0.5889	0.5559	0.4383	0.6000	0.6561	0.6176
53	0.5208	0.6064	0.6126	0.6046	0.5956	0.5629	0.4463	0.6067	0.6627	0.6236
54	0.5313	0.6145	0.6208	0.6131	0.6042	0.5719	0.4567	0.6152	0.6707	0.6312
55	0.5417	0.6231	0.6299	0.6225	0.6137	0.5821	0.4689	0.6248	0.6793	0.6393
56	0.5521	0.6317	0.6389	0.6319	0.6232	0.5922	0.4810	0.6344	0.6879	0.6474
57	0.5625	0.6423	0.6498	0.6431	0.6345	0.6041	0.4950	0.6457	0.6985	0.6572
58	0.5729	0.6583	0.6664	0.6602	0.6516	0.6220	0.5163	0.6627	0.7145	0.6722
59	0.5833	0.6700	0.6784	0.6725	0.6639	0.6347	0.5312	0.6749	0.7262	0.6833
60	0.5938	0.6845	0.6930	0.6876	0.6789	0.6503	0.5494	0.6899	0.7403	0.6970
61	0.6042	0.6990	0.7078	0.7027	0.6941	0.6661	0.5678	0.7050	0.7546	0.7108
62	0.6146	0.7077	0.7163	0.7113	0.7023	0.6743	0.5769	0.7132	0.7632	0.7190
63	0.6250	0.7162	0.7249	0.7201	0.7111	0.6834	0.5874	0.7219	0.7715	0.7272
64	0.6354	0.7263	0.7355	0.7309	0.7221	0.6950	0.6012	0.7328	0.7813	0.7369
65	0.6458	0.7369	0.7462	0.7418	0.7331	0.7066	0.6147	0.7438	0.7914	0.7471
66	0.6563	0.7469	0.7560	0.7518	0.7431	0.7168	0.6264	0.7537	0.8009	0.7569
67	0.6667	0.7557	0.7649	0.7608	0.7520	0.7258	0.6367	0.7625	0.8094	0.7653
68	0.6771	0.7637	0.7731	0.7691	0.7603	0.7345	0.6467	0.7708	0.8172	0.7729
69	0.6875	0.7671	0.7765	0.7725	0.7636	0.7377	0.6502	0.7740	0.8204	0.7762
70	0.6979	0.7726	0.7820	0.7781	0.7691	0.7433	0.6565	0.7795	0.8257	0.7815
71	0.7083	0.7789	0.7883	0.7845	0.7756	0.7499	0.6641	0.7859	0.8317	0.7875
72	0.7188	0.7892	0.7989	0.7953	0.7867	0.7618	0.6782	0.7970	0.8414	0.7976
73	0.7292	0.8009	0.8107	0.8073	0.7992	0.7752	0.6941	0.8095	0.8521	0.8091
74	0.7396	0.8110	0.8210	0.8179	0.8099	0.7865	0.7073	0.8203	0.8616	0.8189
75	0.7500	0.8219	0.8322	0.8293	0.8217	0.7990	0.7219	0.8321	0.8718	0.8295
76	0.7604	0.8328	0.8435	0.8408	0.8335	0.8115	0.7364	0.8438	0.8820	0.8402
77	0.7708	0.8474	0.8583	0.8559	0.8490	0.8279	0.7557	0.8594	0.8956	0.8544
78	0.7812	0.8652	0.8763	0.8742	0.8679	0.8481	0.7797	0.8783	0.9118	0.8718
79	0.7917	0.8768	0.8881	0.8864	0.8809	0.8625	0.7972	0.8915	0.9223	0.8834
80	0.8021	0.8903	0.9021	0.9008	0.8964	0.8799	0.8185	0.9072	0.9343	0.8968
81	0.8125	0.9047	0.9170	0.9162	0.9131	0.8988	0.8416	0.9243	0.9472	0.9111
82	0.8229	0.9150	0.9274	0.9271	0.9250	0.9124	0.8590	0.9364	0.9562	0.9215
83	0.8333	0.9213	0.9336	0.9335	0.9320	0.9203	0.8693	0.9436	0.9616	0.9277
84	0.8437	0.9254	0.9377	0.9377	0.9365	0.9255	0.8763	0.9482	0.9651	0.9319
85	0.8542	0.9279	0.9400	0.9401	0.9389	0.9280	0.8796	0.9507	0.9672	0.9341
86	0.8646	0.9301	0.9422	0.9424	0.9412	0.9305	0.8829	0.9530	0.9691	0.9363
87	0.8750	0.9342	0.9463	0.9467	0.9458	0.9357	0.8903	0.9578	0.9726	0.9403
88	0.8854	0.9372	0.9492	0.9498	0.9493	0.9397	0.8965	0.9613	0.9752	0.9432
89	0.8958	0.9394	0.9514	0.9521	0.9517	0.9425	0.9012	0.9638	0.9772	0.9453
90	0.9062	0.9417	0.9536	0.9543	0.9541	0.9452	0.9058	0.9663	0.9791	0.9474
91	0.9167	0.9438	0.9556	0.9565	0.9563	0.9478	0.9104	0.9687	0.9810	0.9495
92	0.9271	0.9453	0.9568	0.9578	0.9578	0.9500	0.9167	0.9704	0.9823	0.9509
93	0.9375	0.9469	0.9582	0.9593	0.9594	0.9519	0.9214	0.9720	0.9838	0.9524
94	0.9479	0.9484	0.9597	0.9608	0.9609	0.9537	0.9259	0.9737	0.9853	0.9539
95	0.9583	0.9504	0.9615	0.9626	0.9624	0.9548	0.9298	0.9751	0.9874	0.9555
96	0.9687	0.9523	0.9635	0.9645	0.9639	0.9558	0.9336	0.9765	0.9896	0.9572
97	0.9792	0.9543	0.9654	0.9664	0.9655	0.9574	0.9388	0.9781	0.9918	0.9589
98	0.9896	0.9566	0.9676	0.9686	0.9674	0.9591	0.9440	0.9800	0.9942	0.9609
99	1.0000	0.9585	0.9696	0.9706	0.9693	0.9610	0.9491	0.9819	0.9964	0.9628
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		0.99637	-.35748	1.35385						
		Upleg velocity (m/s). Normalised conductivities								
Point no.	y/D	3.6	2.9	2.6	2.3	1.8	1.3	2.2	3.3	3.8
1										
2										
3	0.0000	0.4222	0.4592	0.4932	0.5149	0.5962	1.0000	0.5240	0.4045	0.3595
4	0.0104	0.4243	0.4606	0.4945	0.5159	0.5967	0.9978	0.5248	0.4063	0.3614
5	0.0208	0.4261	0.4618	0.4955	0.5168	0.5971	0.9953	0.5255	0.4079	0.3631
6	0.0313	0.4279	0.4630	0.4965	0.5176	0.5974	0.9929	0.5261	0.4095	0.3647
7	0.0417	0.4297	0.4642	0.4976	0.5184	0.5977	0.9905	0.5267	0.4112	0.3664
8	0.0521	0.4330	0.4667	0.4998	0.5204	0.5993	0.9887	0.5286	0.4142	0.3696
9	0.0625	0.4334	0.4658	0.4989	0.5193	0.5971	0.9780	0.5272	0.4142	0.3704
10	0.0729	0.4331	0.4641	0.4970	0.5173	0.5938	0.9651	0.5249	0.4134	0.3704
11	0.0833	0.4330	0.4626	0.4955	0.5157	0.5909	0.9530	0.5230	0.4129	0.3707
12	0.0938	0.4340	0.4623	0.4952	0.5152	0.5894	0.9426	0.5222	0.4135	0.3720
13	0.1042	0.4331	0.4597	0.4925	0.5125	0.5853	0.9263	0.5192	0.4120	0.3718
14	0.1146	0.4322	0.4572	0.4898	0.5097	0.5812	0.9099	0.5161	0.4106	0.3716
15	0.1250	0.4297	0.4529	0.4854	0.5053	0.5754	0.8910	0.5115	0.4075	0.3701
16	0.1354	0.4273	0.4488	0.4812	0.5011	0.5701	0.8731	0.5071	0.4046	0.3687
17	0.1458	0.4270	0.4474	0.4797	0.4996	0.5679	0.8627	0.5054	0.4038	0.3690
18	0.1563	0.4282	0.4478	0.4800	0.4998	0.5676	0.8547	0.5055	0.4047	0.3707
19	0.1667	0.4269	0.4452	0.4772	0.4970	0.5639	0.8418	0.5025	0.4029	0.3702
20	0.1771	0.4209	0.4375	0.4693	0.4890	0.5543	0.8204	0.4942	0.3965	0.3655
21	0.1875	0.4205	0.4361	0.4678	0.4874	0.5520	0.8110	0.4924	0.3957	0.3657
22	0.1979	0.4228	0.4379	0.4694	0.4889	0.5531	0.8071	0.4938	0.3977	0.3684
23	0.2083	0.4251	0.4397	0.4709	0.4904	0.5543	0.8032	0.4952	0.3997	0.3711
24	0.2188	0.4274	0.4415	0.4725	0.4919	0.5555	0.7993	0.4966	0.4017	0.3738
25	0.2292	0.4329	0.4466	0.4771	0.4964	0.5598	0.7981	0.5009	0.4067	0.3797
26	0.2396	0.4465	0.4598	0.4892	0.5077	0.5705	0.8031	0.5117	0.4196	0.3938
27	0.2500	0.4702	0.4845	0.5131	0.5312	0.5949	0.8269	0.5350	0.4428	0.4169
28	0.2604	0.4906	0.5057	0.5336	0.5513	0.6156	0.8471	0.5549	0.4628	0.4367
29	0.2708	0.4983	0.5132	0.5406	0.5578	0.6216	0.8505	0.5611	0.4701	0.4446
30	0.2813	0.4963	0.5102	0.5370	0.5537	0.6162	0.8386	0.5566	0.4677	0.4436
31	0.2917	0.4855	0.4973	0.5227	0.5386	0.5982	0.8093	0.5407	0.4559	0.4352
32	0.3021	0.4716	0.4811	0.5050	0.5198	0.5761	0.7743	0.5211	0.4411	0.4243
33	0.3125	0.4577	0.4649	0.4872	0.5010	0.5540	0.7393	0.5014	0.4263	0.4134
34	0.3229	0.4411	0.4449	0.4651	0.4774	0.5258	0.6925	0.4765	0.4081	0.4007
35	0.3333	0.4221	0.4220	0.4397	0.4502	0.4930	0.6376	0.4478	0.3874	0.3865
36	0.3438	0.4044	0.4027	0.4189	0.4285	0.4685	0.6036	0.4254	0.3689	0.3717
37	0.3542	0.3848	0.3812	0.3958	0.4046	0.4414	0.5652	0.4007	0.3485	0.3553
38	0.3646	0.3652	0.3597	0.3727	0.3806	0.4143	0.5268	0.3759	0.3280	0.3388
39	0.3750	0.3456	0.3381	0.3496	0.3567	0.3872	0.4885	0.3512	0.3076	0.3224
40	0.3854	0.3260	0.3166	0.3266	0.3327	0.3602	0.4500	0.3265	0.2872	0.3060
41	0.3958	0.3155	0.3052	0.3143	0.3199	0.3457	0.4298	0.3132	0.2761	0.2973
42	0.4063	0.3117	0.3013	0.3099	0.3154	0.3406	0.4232	0.3085	0.2720	0.2941
43	0.4167	0.3097	0.2995	0.3078	0.3132	0.3380	0.4199	0.3062	0.2699	0.2927
44	0.4271	0.3081	0.2984	0.3065	0.3120	0.3367	0.4186	0.3048	0.2681	0.2917
45	0.4375	0.3105	0.3018	0.3097	0.3155	0.3404	0.4242	0.3081	0.2702	0.2942
46	0.4479	0.3097	0.3018	0.3094	0.3152	0.3400	0.4246	0.3077	0.2692	0.2939
47	0.4583	0.3124	0.3058	0.3133	0.3194	0.3447	0.4317	0.3118	0.2718	0.2967
48	0.4688	0.3119	0.3062	0.3136	0.3199	0.3453	0.4336	0.3121	0.2711	0.2966
49	0.4792	0.3041	0.2986	0.3055	0.3118	0.3366	0.4239	0.3039	0.2631	0.2896
50	0.4896	0.3008	0.2958	0.3024	0.3089	0.3336	0.4211	0.3008	0.2597	0.2868

51	0.5000	0.2987	0.2942	0.3006	0.3072	0.3319	0.4198	0.2991	0.2574	0.2851
52	0.5104	0.2928	0.2883	0.2944	0.3010	0.3253	0.4122	0.2928	0.2514	0.2798
53	0.5208	0.2880	0.2835	0.2894	0.2960	0.3202	0.4063	0.2878	0.2465	0.2753
54	0.5313	0.2821	0.2774	0.2831	0.2897	0.3135	0.3986	0.2815	0.2406	0.2697
55	0.5417	0.2757	0.2707	0.2762	0.2827	0.3060	0.3896	0.2745	0.2342	0.2638
56	0.5521	0.2693	0.2640	0.2692	0.2756	0.2985	0.3807	0.2674	0.2279	0.2578
57	0.5625	0.2615	0.2560	0.2609	0.2673	0.2898	0.3703	0.2590	0.2200	0.2505
58	0.5729	0.2497	0.2437	0.2483	0.2546	0.2765	0.3546	0.2464	0.2082	0.2394
59	0.5833	0.2410	0.2349	0.2392	0.2456	0.2671	0.3436	0.2374	0.1996	0.2313
60	0.5938	0.2304	0.2240	0.2281	0.2345	0.2556	0.3301	0.2264	0.1891	0.2211
61	0.6042	0.2197	0.2131	0.2169	0.2233	0.2439	0.3166	0.2152	0.1786	0.2109
62	0.6146	0.2133	0.2069	0.2106	0.2172	0.2379	0.3098	0.2092	0.1722	0.2049
63	0.6250	0.2069	0.2005	0.2041	0.2107	0.2312	0.3021	0.2027	0.1661	0.1988
64	0.6354	0.1995	0.1927	0.1961	0.2026	0.2226	0.2919	0.1947	0.1588	0.1916
65	0.6458	0.1917	0.1848	0.1881	0.1944	0.2141	0.2819	0.1865	0.1514	0.1841
66	0.6563	0.1843	0.1775	0.1807	0.1871	0.2065	0.2733	0.1792	0.1444	0.1769
67	0.6667	0.1778	0.1710	0.1740	0.1805	0.1998	0.2657	0.1727	0.1381	0.1707
68	0.6771	0.1719	0.1649	0.1679	0.1743	0.1935	0.2583	0.1666	0.1324	0.1650
69	0.6875	0.1693	0.1624	0.1654	0.1719	0.1911	0.2557	0.1642	0.1299	0.1626
70	0.6979	0.1653	0.1584	0.1613	0.1678	0.1869	0.2510	0.1602	0.1261	0.1587
71	0.7083	0.1606	0.1537	0.1565	0.1631	0.1821	0.2454	0.1555	0.1216	0.1543
72	0.7188	0.1530	0.1459	0.1485	0.1549	0.1733	0.2350	0.1473	0.1145	0.1468
73	0.7292	0.1444	0.1371	0.1396	0.1457	0.1634	0.2233	0.1380	0.1066	0.1384
74	0.7396	0.1370	0.1295	0.1319	0.1377	0.1550	0.2135	0.1301	0.0996	0.1311
75	0.7500	0.1289	0.1212	0.1234	0.1290	0.1458	0.2028	0.1214	0.0920	0.1232
76	0.7604	0.1208	0.1129	0.1149	0.1203	0.1366	0.1920	0.1127	0.0845	0.1154
77	0.7708	0.1100	0.1020	0.1038	0.1089	0.1245	0.1778	0.1012	0.0745	0.1049
78	0.7812	0.0969	0.0887	0.0903	0.0949	0.1096	0.1601	0.0872	0.0625	0.0920
79	0.7917	0.0883	0.0800	0.0812	0.0853	0.0989	0.1471	0.0775	0.0547	0.0835
80	0.8021	0.0784	0.0697	0.0706	0.0738	0.0861	0.1314	0.0658	0.0458	0.0736
81	0.8125	0.0677	0.0587	0.0592	0.0615	0.0721	0.1143	0.0532	0.0363	0.0630
82	0.8229	0.0601	0.0510	0.0512	0.0527	0.0620	0.1015	0.0443	0.0297	0.0553
83	0.8333	0.0555	0.0464	0.0464	0.0476	0.0562	0.0938	0.0390	0.0257	0.0507
84	0.8437	0.0524	0.0434	0.0433	0.0443	0.0524	0.0887	0.0356	0.0231	0.0477
85	0.8542	0.0506	0.0417	0.0415	0.0424	0.0505	0.0862	0.0337	0.0216	0.0460
86	0.8646	0.0489	0.0400	0.0399	0.0407	0.0487	0.0838	0.0320	0.0201	0.0444
87	0.8750	0.0459	0.0370	0.0367	0.0373	0.0448	0.0784	0.0285	0.0175	0.0414
88	0.8854	0.0437	0.0348	0.0344	0.0348	0.0418	0.0738	0.0259	0.0156	0.0393
89	0.8958	0.0421	0.0332	0.0327	0.0330	0.0398	0.0703	0.0240	0.0142	0.0377
90	0.9062	0.0404	0.0316	0.0311	0.0312	0.0378	0.0669	0.0222	0.0128	0.0362
91	0.9167	0.0388	0.0301	0.0295	0.0296	0.0359	0.0635	0.0205	0.0114	0.0347
92	0.9271	0.0377	0.0292	0.0285	0.0285	0.0343	0.0588	0.0192	0.0104	0.0336
93	0.9375	0.0366	0.0282	0.0274	0.0273	0.0329	0.0554	0.0180	0.0093	0.0325
94	0.9479	0.0354	0.0271	0.0263	0.0262	0.0315	0.0520	0.0168	0.0082	0.0314
95	0.9583	0.0340	0.0257	0.0249	0.0251	0.0307	0.0492	0.0157	0.0066	0.0302
96	0.9687	0.0325	0.0243	0.0235	0.0240	0.0300	0.0464	0.0147	0.0050	0.0290
97	0.9792	0.0311	0.0229	0.0222	0.0228	0.0288	0.0425	0.0135	0.0034	0.0277
98	0.9896	0.0294	0.0213	0.0205	0.0214	0.0276	0.0387	0.0121	0.0016	0.0262
99	1.0000	0.0279	0.0198	0.0190	0.0200	0.0261	0.0349	0.0107	0.0000	0.0248
100										
101										

d56_k06ss3sc30

-1		1.1638	0.19105	0.97275					
		Upleg velocity (m/s)							
Point no.	y/D	3.1	3.4	2.7	2.5	2.0	1.8	1.6	3.9
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	0.0000	0.6132	0.6449	0.5839	0.4695	0.3940	0.3405	0.2741	0.7451
4	0.0104	0.6098	0.6414	0.5806	0.4665	0.3913	0.3383	0.2724	0.7420
5	0.0208	0.6067	0.6383	0.5777	0.4637	0.3888	0.3364	0.2710	0.7392
6	0.0313	0.6036	0.6351	0.5747	0.4609	0.3864	0.3344	0.2697	0.7364
7	0.0417	0.6005	0.6319	0.5716	0.4581	0.3839	0.3324	0.2682	0.7335
8	0.0521	0.5955	0.6269	0.5668	0.4532	0.3792	0.3282	0.2646	0.7288
9	0.0625	0.5926	0.6237	0.5642	0.4506	0.3772	0.3273	0.2653	0.7261
10	0.0729	0.5902	0.6210	0.5622	0.4487	0.3758	0.3274	0.2672	0.7240
11	0.0833	0.5876	0.6180	0.5600	0.4465	0.3743	0.3272	0.2687	0.7216
12	0.0938	0.5837	0.6140	0.5564	0.4429	0.3711	0.3253	0.2684	0.7182
13	0.1042	0.5817	0.6114	0.5549	0.4412	0.3699	0.3255	0.2708	0.7161
14	0.1146	0.5796	0.6089	0.5534	0.4395	0.3687	0.3258	0.2731	0.7141
15	0.1250	0.5797	0.6084	0.5541	0.4401	0.3697	0.3283	0.2778	0.7137
16	0.1354	0.5799	0.6081	0.5550	0.4408	0.3707	0.3307	0.2822	0.7134
17	0.1458	0.5786	0.6065	0.5540	0.4396	0.3697	0.3304	0.2833	0.7119
18	0.1563	0.5755	0.6032	0.5510	0.4362	0.3664	0.3279	0.2818	0.7086
19	0.1667	0.5752	0.6025	0.5512	0.4363	0.3668	0.3291	0.2846	0.7078
20	0.1771	0.5798	0.6064	0.5566	0.4421	0.3732	0.3370	0.2944	0.7113
21	0.1875	0.5790	0.6053	0.5561	0.4415	0.3728	0.3372	0.2957	0.7100
22	0.1979	0.5753	0.6016	0.5524	0.4376	0.3689	0.3336	0.2928	0.7061
23	0.2083	0.5717	0.5979	0.5488	0.4337	0.3650	0.3301	0.2899	0.7022
24	0.2188	0.5680	0.5942	0.5451	0.4297	0.3611	0.3265	0.2870	0.6983
25	0.2292	0.5612	0.5876	0.5381	0.4224	0.3536	0.3190	0.2802	0.6909
26	0.2396	0.5446	0.5715	0.5209	0.4050	0.3366	0.3018	0.2634	0.6733
27	0.2500	0.5166	0.5451	0.4914	0.3739	0.3047	0.2689	0.2299	0.6461
28	0.2604	0.4921	0.5218	0.4656	0.3468	0.2770	0.2405	0.2011	0.6225
29	0.2708	0.4819	0.5120	0.4550	0.3361	0.2665	0.2302	0.1911	0.6122
30	0.2813	0.4835	0.5133	0.4567	0.3389	0.2702	0.2346	0.1965	0.6120
31	0.2917	0.4973	0.5261	0.4710	0.3562	0.2897	0.2556	0.2191	0.6206
32	0.3021	0.5151	0.5427	0.4894	0.3783	0.3144	0.2820	0.2474	0.6322
33	0.3125	0.5330	0.5594	0.5078	0.4005	0.3391	0.3084	0.2757	0.6438
34	0.3229	0.5533	0.5782	0.5288	0.4263	0.3685	0.3403	0.3103	0.6560
35	0.3333	0.5761	0.5992	0.5521	0.4555	0.4017	0.3767	0.3501	0.6693
36	0.3438	0.6014	0.6235	0.5776	0.4854	0.4346	0.4109	0.3856	0.6872
37	0.3542	0.6281	0.6489	0.6047	0.5170	0.4691	0.4471	0.4234	0.7064
38	0.3646	0.6548	0.6744	0.6317	0.5486	0.5037	0.4832	0.4612	0.7257
39	0.3750	0.6815	0.6998	0.6588	0.5803	0.5382	0.5194	0.4990	0.7449
40	0.3854	0.7082	0.7253	0.6859	0.6119	0.5728	0.5556	0.5368	0.7641
41	0.3958	0.7229	0.7394	0.7006	0.6292	0.5918	0.5755	0.5575	0.7743
42	0.4063	0.7287	0.7452	0.7060	0.6359	0.5991	0.5831	0.5653	0.7781
43	0.4167	0.7320	0.7486	0.7088	0.6396	0.6032	0.5874	0.5697	0.7799
44	0.4271	0.7349	0.7519	0.7106	0.6424	0.6063	0.5906	0.5728	0.7811
45	0.4375	0.7327	0.7506	0.7070	0.6393	0.6030	0.5872	0.5691	0.7781
46	0.4479	0.7352	0.7536	0.7083	0.6416	0.6057	0.5899	0.5717	0.7788
47	0.4583	0.7327	0.7520	0.7041	0.6378	0.6016	0.5855	0.5669	0.7755
48	0.4688	0.7345	0.7545	0.7046	0.6392	0.6030	0.5870	0.5681	0.7759
49	0.4792	0.7468	0.7668	0.7163	0.6526	0.6175	0.6017	0.5829	0.7851

50	0.4896	0.7522	0.7725	0.7209	0.6581	0.6233	0.6076	0.5888	0.7887
51	0.5000	0.7559	0.7764	0.7238	0.6616	0.6271	0.6113	0.5925	0.7909
52	0.5104	0.7646	0.7850	0.7323	0.6711	0.6372	0.6216	0.6029	0.7975
53	0.5208	0.7717	0.7920	0.7392	0.6788	0.6453	0.6299	0.6113	0.8032
54	0.5313	0.7805	0.8006	0.7483	0.6886	0.6557	0.6406	0.6222	0.8105
55	0.5417	0.7899	0.8096	0.7580	0.6993	0.6671	0.6522	0.6341	0.8183
56	0.5521	0.7993	0.8187	0.7678	0.7099	0.6785	0.6639	0.6460	0.8262
57	0.5625	0.8106	0.8296	0.7793	0.7223	0.6917	0.6773	0.6597	0.8354
58	0.5729	0.8276	0.8460	0.7967	0.7411	0.7116	0.6975	0.6803	0.8495
59	0.5833	0.8399	0.8580	0.8093	0.7547	0.7258	0.7119	0.6950	0.8600
60	0.5938	0.8554	0.8730	0.8253	0.7719	0.7440	0.7304	0.7139	0.8734
61	0.6042	0.8711	0.8881	0.8415	0.7893	0.7623	0.7490	0.7329	0.8869
62	0.6146	0.8800	0.8970	0.8502	0.7986	0.7718	0.7584	0.7424	0.8944
63	0.6250	0.8892	0.9059	0.8598	0.8088	0.7826	0.7693	0.7535	0.9025
64	0.6354	0.9003	0.9165	0.8715	0.8214	0.7960	0.7831	0.7676	0.9124
65	0.6458	0.9119	0.9276	0.8837	0.8346	0.8099	0.7972	0.7820	0.9228
66	0.6563	0.9227	0.9381	0.8950	0.8466	0.8226	0.8099	0.7950	0.9327
67	0.6667	0.9320	0.9471	0.9046	0.8568	0.8332	0.8205	0.8057	0.9409
68	0.6771	0.9406	0.9554	0.9136	0.8664	0.8432	0.8306	0.8161	0.9485
69	0.6875	0.9442	0.9588	0.9173	0.8703	0.8472	0.8345	0.8200	0.9517
70	0.6979	0.9500	0.9645	0.9234	0.8768	0.8539	0.8412	0.8268	0.9570
71	0.7083	0.9567	0.9710	0.9304	0.8842	0.8617	0.8490	0.8347	0.9630
72	0.7188	0.9684	0.9820	0.9429	0.8979	0.8763	0.8639	0.8500	0.9739
73	0.7292	0.9815	0.9945	0.9572	0.9136	0.8932	0.8810	0.8676	0.9863
74	0.7396	0.9928	1.0053	0.9694	0.9267	0.9071	0.8951	0.8820	0.9967
75	0.7500	1.0051	1.0169	0.9826	0.9411	0.9224	0.9105	0.8977	1.0080
76	0.7604	1.0174	1.0286	0.9958	0.9554	0.9377	0.9259	0.9135	1.0193
77	0.7708	1.0338	1.0442	1.0135	0.9746	0.9581	0.9465	0.9346	1.0347
78	0.7812	1.0540	1.0633	1.0354	0.9985	0.9836	0.9724	0.9612	1.0539
79	0.7917	1.0676	1.0761	1.0506	1.0154	1.0021	0.9915	0.9808	1.0671
80	0.8021	1.0839	1.0913	1.0687	1.0359	1.0246	1.0146	1.0047	1.0829
81	0.8125	1.1015	1.1076	1.0884	1.0582	1.0491	1.0398	1.0307	1.1000
82	0.8229	1.1140	1.1193	1.1026	1.0744	1.0672	1.0585	1.0502	1.1126
83	0.8333	1.1214	1.1263	1.1110	1.0841	1.0778	1.0695	1.0617	1.1202
84	0.8437	1.1263	1.1309	1.1164	1.0903	1.0847	1.0766	1.0692	1.1252
85	0.8542	1.1290	1.1335	1.1193	1.0935	1.0881	1.0800	1.0728	1.1279
86	0.8646	1.1315	1.1359	1.1221	1.0966	1.0913	1.0832	1.0761	1.1303
87	0.8750	1.1363	1.1405	1.1276	1.1029	1.0984	1.0905	1.0838	1.1352
88	0.8854	1.1398	1.1438	1.1315	1.1074	1.1036	1.0959	1.0896	1.1388
89	0.8958	1.1422	1.1462	1.1342	1.1106	1.1071	1.0997	1.0937	1.1413
90	0.9062	1.1447	1.1485	1.1369	1.1137	1.1106	1.1034	1.0978	1.1438
91	0.9167	1.1470	1.1508	1.1395	1.1166	1.1140	1.1070	1.1017	1.1462
92	0.9271	1.1481	1.1521	1.1408	1.1185	1.1167	1.1103	1.1057	1.1478
93	0.9375	1.1495	1.1536	1.1422	1.1203	1.1189	1.1129	1.1087	1.1493
94	0.9479	1.1509	1.1550	1.1437	1.1221	1.1210	1.1153	1.1115	1.1509
95	0.9583	1.1522	1.1567	1.1448	1.1228	1.1216	1.1160	1.1125	1.1519
96	0.9687	1.1536	1.1583	1.1458	1.1233	1.1219	1.1164	1.1131	1.1529
97	0.9792	1.1550	1.1599	1.1470	1.1244	1.1231	1.1179	1.1151	1.1543
98	0.9896	1.1567	1.1619	1.1485	1.1256	1.1244	1.1195	1.1171	1.1558
99	1.0000	1.1585	1.1638	1.1502	1.1274	1.1263	1.1217	1.1197	1.1575
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		1.1638		0.19105	0.97275				
		Upleg velocity (m/s). Normalised conductivities							
Point no.	y/D	3.1	3.4	2.7	2.5	2.0	1.8	1.6	3.9
1									
2									
3	0.0000	0.5661	0.5335	0.5961	0.7137	0.7914	0.8463	0.9146	0.4304
4	0.0104	0.5695	0.5370	0.5995	0.7169	0.7942	0.8486	0.9164	0.4336
5	0.0208	0.5727	0.5403	0.6026	0.7197	0.7967	0.8506	0.9178	0.4365
6	0.0313	0.5759	0.5435	0.6056	0.7226	0.7992	0.8526	0.9192	0.4394
7	0.0417	0.5791	0.5468	0.6088	0.7255	0.8018	0.8547	0.9207	0.4424
8	0.0521	0.5842	0.5519	0.6137	0.7305	0.8065	0.8590	0.9244	0.4472
9	0.0625	0.5872	0.5553	0.6164	0.7331	0.8087	0.8599	0.9237	0.4500
10	0.0729	0.5897	0.5581	0.6184	0.7351	0.8100	0.8598	0.9217	0.4522
11	0.0833	0.5924	0.5611	0.6207	0.7374	0.8117	0.8601	0.9202	0.4546
12	0.0938	0.5963	0.5653	0.6244	0.7411	0.8149	0.8620	0.9205	0.4581
13	0.1042	0.5984	0.5678	0.6259	0.7428	0.8162	0.8617	0.9180	0.4602
14	0.1146	0.6005	0.5704	0.6275	0.7446	0.8174	0.8615	0.9156	0.4623
15	0.1250	0.6005	0.5710	0.6268	0.7440	0.8164	0.8589	0.9108	0.4627
16	0.1354	0.6002	0.5713	0.6259	0.7433	0.8153	0.8565	0.9063	0.4630
17	0.1458	0.6016	0.5729	0.6269	0.7445	0.8164	0.8567	0.9052	0.4646
18	0.1563	0.6048	0.5763	0.6299	0.7479	0.8197	0.8594	0.9067	0.4679
19	0.1667	0.6051	0.5770	0.6298	0.7479	0.8194	0.8581	0.9039	0.4687
20	0.1771	0.6003	0.5730	0.6242	0.7419	0.8127	0.8500	0.8938	0.4652
21	0.1875	0.6012	0.5741	0.6248	0.7425	0.8131	0.8497	0.8924	0.4665
22	0.1979	0.6050	0.5779	0.6285	0.7466	0.8172	0.8534	0.8954	0.4705
23	0.2083	0.6087	0.5817	0.6323	0.7506	0.8212	0.8571	0.8984	0.4745
24	0.2188	0.6125	0.5855	0.6360	0.7546	0.8252	0.8608	0.9013	0.4786
25	0.2292	0.6195	0.5923	0.6432	0.7622	0.8329	0.8684	0.9084	0.4862
26	0.2396	0.6366	0.6089	0.6609	0.7801	0.8504	0.8861	0.9257	0.5043
27	0.2500	0.6654	0.6361	0.6912	0.8120	0.8832	0.9200	0.9601	0.5322
28	0.2604	0.6905	0.6599	0.7177	0.8399	0.9116	0.9492	0.9897	0.5565
29	0.2708	0.7010	0.6701	0.7287	0.8509	0.9224	0.9598	1.0000	0.5671
30	0.2813	0.6993	0.6687	0.7269	0.8480	0.9186	0.9552	0.9944	0.5673
31	0.2917	0.6852	0.6556	0.7122	0.8302	0.8986	0.9337	0.9712	0.5584
32	0.3021	0.6668	0.6385	0.6933	0.8075	0.8732	0.9065	0.9421	0.5465
33	0.3125	0.6485	0.6214	0.6744	0.7847	0.8478	0.8793	0.9130	0.5346
34	0.3229	0.6276	0.6020	0.6528	0.7582	0.8176	0.8466	0.8774	0.5220
35	0.3333	0.6042	0.5804	0.6288	0.7282	0.7834	0.8092	0.8365	0.5084
36	0.3438	0.5782	0.5555	0.6027	0.6974	0.7497	0.7740	0.8000	0.4899
37	0.3542	0.5507	0.5293	0.5748	0.6649	0.7142	0.7368	0.7611	0.4702
38	0.3646	0.5233	0.5031	0.5470	0.6324	0.6786	0.6996	0.7223	0.4504
39	0.3750	0.4958	0.4770	0.5191	0.5999	0.6431	0.6624	0.6834	0.4307
40	0.3854	0.4684	0.4508	0.4913	0.5674	0.6076	0.6252	0.6446	0.4109
41	0.3958	0.4533	0.4362	0.4762	0.5496	0.5881	0.6048	0.6233	0.4004
42	0.4063	0.4473	0.4303	0.4706	0.5427	0.5805	0.5970	0.6153	0.3965
43	0.4167	0.4439	0.4268	0.4678	0.5389	0.5763	0.5925	0.6108	0.3947
44	0.4271	0.4410	0.4234	0.4659	0.5360	0.5731	0.5893	0.6076	0.3934
45	0.4375	0.4431	0.4248	0.4696	0.5392	0.5765	0.5928	0.6114	0.3965
46	0.4479	0.4406	0.4216	0.4683	0.5368	0.5737	0.5899	0.6087	0.3958
47	0.4583	0.4432	0.4233	0.4726	0.5408	0.5780	0.5945	0.6136	0.3991
48	0.4688	0.4413	0.4207	0.4721	0.5393	0.5765	0.5930	0.6124	0.3988
49	0.4792	0.4287	0.4081	0.4600	0.5255	0.5616	0.5779	0.5971	0.3893
50	0.4896	0.4231	0.4023	0.4553	0.5199	0.5556	0.5718	0.5911	0.3856

51	0.5000	0.4194	0.3982	0.4524	0.5163	0.5518	0.5679	0.5873	0.3834
52	0.5104	0.4104	0.3894	0.4436	0.5065	0.5414	0.5574	0.5766	0.3766
53	0.5208	0.4031	0.3822	0.4365	0.4986	0.5331	0.5489	0.5680	0.3708
54	0.5313	0.3940	0.3734	0.4272	0.4885	0.5223	0.5379	0.5568	0.3632
55	0.5417	0.3843	0.3641	0.4171	0.4776	0.5106	0.5259	0.5445	0.3551
56	0.5521	0.3747	0.3548	0.4071	0.4666	0.4989	0.5139	0.5323	0.3471
57	0.5625	0.3631	0.3436	0.3953	0.4538	0.4853	0.5001	0.5182	0.3376
58	0.5729	0.3457	0.3267	0.3774	0.4346	0.4649	0.4794	0.4970	0.3231
59	0.5833	0.3330	0.3144	0.3644	0.4206	0.4503	0.4645	0.4819	0.3123
60	0.5938	0.3170	0.2990	0.3480	0.4029	0.4316	0.4456	0.4626	0.2986
61	0.6042	0.3009	0.2834	0.3314	0.3850	0.4127	0.4264	0.4430	0.2847
62	0.6146	0.2918	0.2743	0.3224	0.3755	0.4030	0.4167	0.4332	0.2770
63	0.6250	0.2823	0.2651	0.3125	0.3649	0.3919	0.4055	0.4218	0.2686
64	0.6354	0.2709	0.2543	0.3004	0.3520	0.3781	0.3914	0.4073	0.2585
65	0.6458	0.2590	0.2429	0.2879	0.3385	0.3638	0.3768	0.3925	0.2477
66	0.6563	0.2479	0.2321	0.2764	0.3261	0.3508	0.3638	0.3791	0.2376
67	0.6667	0.2383	0.2228	0.2665	0.3156	0.3399	0.3529	0.3681	0.2291
68	0.6771	0.2295	0.2143	0.2572	0.3057	0.3296	0.3425	0.3575	0.2213
69	0.6875	0.2258	0.2107	0.2535	0.3017	0.3255	0.3385	0.3535	0.2181
70	0.6979	0.2198	0.2049	0.2472	0.2951	0.3186	0.3316	0.3464	0.2126
71	0.7083	0.2129	0.1982	0.2400	0.2874	0.3106	0.3236	0.3383	0.2064
72	0.7188	0.2009	0.1869	0.2270	0.2733	0.2955	0.3083	0.3225	0.1953
73	0.7292	0.1874	0.1740	0.2124	0.2572	0.2782	0.2907	0.3045	0.1825
74	0.7396	0.1757	0.1629	0.1999	0.2437	0.2639	0.2763	0.2897	0.1717
75	0.7500	0.1631	0.1510	0.1863	0.2290	0.2482	0.2604	0.2736	0.1602
76	0.7604	0.1505	0.1390	0.1727	0.2142	0.2325	0.2446	0.2574	0.1485
77	0.7708	0.1336	0.1230	0.1545	0.1945	0.2115	0.2234	0.2356	0.1327
78	0.7812	0.1129	0.1033	0.1320	0.1699	0.1853	0.1967	0.2083	0.1130
79	0.7917	0.0989	0.0902	0.1164	0.1526	0.1662	0.1772	0.1881	0.0994
80	0.8021	0.0821	0.0745	0.0978	0.1315	0.1431	0.1534	0.1636	0.0832
81	0.8125	0.0640	0.0578	0.0775	0.1086	0.1179	0.1275	0.1368	0.0656
82	0.8229	0.0512	0.0457	0.0629	0.0919	0.0993	0.1082	0.1168	0.0526
83	0.8333	0.0436	0.0386	0.0543	0.0819	0.0884	0.0969	0.1050	0.0448
84	0.8437	0.0386	0.0338	0.0487	0.0756	0.0813	0.0896	0.0973	0.0397
85	0.8542	0.0358	0.0311	0.0457	0.0723	0.0778	0.0861	0.0935	0.0369
86	0.8646	0.0332	0.0287	0.0429	0.0691	0.0745	0.0829	0.0902	0.0344
87	0.8750	0.0283	0.0240	0.0372	0.0626	0.0672	0.0754	0.0822	0.0294
88	0.8854	0.0247	0.0206	0.0332	0.0580	0.0619	0.0698	0.0763	0.0257
89	0.8958	0.0222	0.0181	0.0304	0.0547	0.0583	0.0659	0.0721	0.0231
90	0.9062	0.0196	0.0157	0.0277	0.0515	0.0547	0.0621	0.0678	0.0206
91	0.9167	0.0173	0.0134	0.0250	0.0485	0.0512	0.0584	0.0638	0.0181
92	0.9271	0.0161	0.0120	0.0236	0.0466	0.0484	0.0550	0.0597	0.0164
93	0.9375	0.0147	0.0105	0.0222	0.0447	0.0462	0.0523	0.0566	0.0149
94	0.9479	0.0133	0.0090	0.0207	0.0429	0.0440	0.0499	0.0538	0.0133
95	0.9583	0.0119	0.0073	0.0195	0.0421	0.0434	0.0491	0.0527	0.0122
96	0.9687	0.0105	0.0057	0.0185	0.0416	0.0431	0.0487	0.0521	0.0112
97	0.9792	0.0090	0.0040	0.0173	0.0405	0.0418	0.0472	0.0501	0.0098
98	0.9896	0.0073	0.0020	0.0157	0.0393	0.0405	0.0455	0.0480	0.0082
99	1.0000	0.0054	0.0000	0.0140	0.0374	0.0386	0.0433	0.0453	0.0065
100									
101									

d56_k10ss1sc10

-1		1.0651	0.59901	0.46609								
		Upleg velocity (m/s)										
Point no.	y/D	6.0	5.2	4.7	4.2	3.9	3.6	3.3	2.9	2.5	2.0	1.2
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	0.0000	0.9302	0.9365	0.9394	0.9464	0.9405	0.9369	0.8917	0.8375	0.8532	0.7676	0.6047
4	0.0104	0.9298	0.9362	0.9391	0.9461	0.9404	0.9372	0.8927	0.8384	0.8547	0.7696	0.6087
5	0.0208	0.9295	0.9359	0.9388	0.9459	0.9403	0.9376	0.8937	0.8392	0.8563	0.7716	0.6129
6	0.0313	0.9291	0.9355	0.9384	0.9457	0.9402	0.9379	0.8948	0.8401	0.8578	0.7737	0.6171
7	0.0417	0.9288	0.9352	0.9381	0.9455	0.9401	0.9383	0.8958	0.8410	0.8595	0.7758	0.6213
8	0.0521	0.9283	0.9348	0.9377	0.9451	0.9398	0.9384	0.8963	0.8416	0.8605	0.7770	0.6240
9	0.0625	0.9280	0.9344	0.9375	0.9451	0.9402	0.9393	0.8989	0.8449	0.8642	0.7830	0.6345
10	0.0729	0.9277	0.9341	0.9373	0.9451	0.9406	0.9405	0.9021	0.8489	0.8685	0.7903	0.6470
11	0.0833	0.9273	0.9338	0.9371	0.9451	0.9411	0.9416	0.9052	0.8527	0.8727	0.7971	0.6589
12	0.0938	0.9270	0.9335	0.9369	0.9451	0.9414	0.9424	0.9076	0.8560	0.8762	0.8030	0.6691
13	0.1042	0.9267	0.9332	0.9367	0.9451	0.9420	0.9436	0.9109	0.8607	0.8807	0.8109	0.6824
14	0.1146	0.9263	0.9329	0.9365	0.9452	0.9425	0.9447	0.9142	0.8654	0.8852	0.8189	0.6958
15	0.1250	0.9261	0.9326	0.9365	0.9453	0.9432	0.9459	0.9176	0.8705	0.8898	0.8273	0.7102
16	0.1354	0.9258	0.9324	0.9364	0.9454	0.9438	0.9469	0.9206	0.8752	0.8938	0.8347	0.7229
17	0.1458	0.9256	0.9321	0.9362	0.9453	0.9440	0.9473	0.9221	0.8778	0.8959	0.8388	0.7298
18	0.1563	0.9252	0.9318	0.9360	0.9451	0.9440	0.9473	0.9226	0.8797	0.8971	0.8413	0.7345
19	0.1667	0.9250	0.9316	0.9358	0.9451	0.9444	0.9478	0.9246	0.8831	0.8999	0.8465	0.7431
20	0.1771	0.9249	0.9315	0.9360	0.9454	0.9454	0.9495	0.9292	0.8889	0.9052	0.8561	0.7583
21	0.1875	0.9246	0.9312	0.9358	0.9452	0.9455	0.9497	0.9303	0.8911	0.9068	0.8593	0.7636
22	0.1979	0.9242	0.9308	0.9354	0.9449	0.9452	0.9492	0.9298	0.8917	0.9067	0.8594	0.7644
23	0.2083	0.9239	0.9304	0.9351	0.9445	0.9449	0.9487	0.9294	0.8923	0.9066	0.8596	0.7652
24	0.2188	0.9235	0.9301	0.9347	0.9441	0.9446	0.9482	0.9289	0.8928	0.9065	0.8597	0.7659
25	0.2292	0.9228	0.9293	0.9339	0.9432	0.9437	0.9465	0.9262	0.8916	0.9041	0.8561	0.7614
26	0.2396	0.9212	0.9276	0.9320	0.9410	0.9413	0.9429	0.9207	0.8879	0.8990	0.8471	0.7481
27	0.2500	0.9195	0.9257	0.9298	0.9383	0.9378	0.9370	0.9097	0.8788	0.8881	0.8285	0.7207
28	0.2604	0.9180	0.9241	0.9278	0.9360	0.9348	0.9323	0.9008	0.8715	0.8796	0.8135	0.6984
29	0.2708	0.9171	0.9232	0.9269	0.9350	0.9337	0.9308	0.8989	0.8701	0.8779	0.8102	0.6930
30	0.2813	0.9166	0.9227	0.9264	0.9345	0.9336	0.9309	0.9008	0.8725	0.8800	0.8138	0.6984
31	0.2917	0.9158	0.9220	0.9258	0.9339	0.9335	0.9316	0.9054	0.8777	0.8848	0.8220	0.7116
32	0.3021	0.9150	0.9212	0.9252	0.9332	0.9335	0.9324	0.9109	0.8839	0.8905	0.8319	0.7273
33	0.3125	0.9142	0.9204	0.9246	0.9325	0.9335	0.9332	0.9164	0.8900	0.8962	0.8417	0.7430
34	0.3229	0.9129	0.9191	0.9236	0.9315	0.9335	0.9344	0.9245	0.8989	0.9045	0.8559	0.7651
35	0.3333	0.9113	0.9175	0.9224	0.9302	0.9333	0.9358	0.9343	0.9095	0.9145	0.8730	0.7914
36	0.3438	0.9110	0.9172	0.9221	0.9297	0.9332	0.9362	0.9387	0.9143	0.9190	0.8808	0.8050
37	0.3542	0.9106	0.9169	0.9220	0.9293	0.9334	0.9372	0.9446	0.9204	0.9249	0.8913	0.8225
38	0.3646	0.9103	0.9166	0.9218	0.9289	0.9336	0.9382	0.9505	0.9266	0.9308	0.9018	0.8400
39	0.3750	0.9099	0.9163	0.9217	0.9286	0.9338	0.9392	0.9564	0.9328	0.9367	0.9123	0.8576
40	0.3854	0.9096	0.9159	0.9215	0.9282	0.9340	0.9401	0.9623	0.9390	0.9427	0.9228	0.8751
41	0.3958	0.9094	0.9157	0.9214	0.9278	0.9339	0.9404	0.9652	0.9420	0.9455	0.9278	0.8837
42	0.4063	0.9093	0.9157	0.9213	0.9276	0.9337	0.9401	0.9659	0.9426	0.9460	0.9289	0.8859
43	0.4167	0.9093	0.9156	0.9212	0.9273	0.9333	0.9397	0.9660	0.9426	0.9459	0.9290	0.8863
44	0.4271	0.9095	0.9158	0.9213	0.9271	0.9329	0.9391	0.9658	0.9424	0.9453	0.9284	0.8859
45	0.4375	0.9097	0.9159	0.9213	0.9268	0.9323	0.9380	0.9643	0.9409	0.9433	0.9253	0.8816
46	0.4479	0.9099	0.9161	0.9214	0.9264	0.9317	0.9369	0.9634	0.9399	0.9421	0.9236	0.8794
47	0.4583	0.9103	0.9164	0.9215	0.9262	0.9310	0.9357	0.9616	0.9382	0.9397	0.9201	0.8745
48	0.4688	0.9107	0.9167	0.9216	0.9260	0.9305	0.9348	0.9606	0.9372	0.9383	0.9182	0.8721
49	0.4792	0.9112	0.9172	0.9220	0.9261	0.9305	0.9346	0.9613	0.9381	0.9391	0.9199	0.8757

50	0.4896	0.9116	0.9175	0.9223	0.9260	0.9303	0.9342	0.9613	0.9381	0.9389	0.9201	0.8765
51	0.5000	0.9119	0.9177	0.9224	0.9259	0.9300	0.9337	0.9611	0.9379	0.9383	0.9198	0.8766
52	0.5104	0.9123	0.9181	0.9227	0.9261	0.9302	0.9338	0.9620	0.9389	0.9393	0.9219	0.8803
53	0.5208	0.9128	0.9185	0.9231	0.9264	0.9304	0.9341	0.9628	0.9399	0.9403	0.9237	0.8835
54	0.5313	0.9133	0.9191	0.9235	0.9268	0.9309	0.9346	0.9637	0.9413	0.9416	0.9260	0.8874
55	0.5417	0.9137	0.9194	0.9239	0.9272	0.9313	0.9351	0.9648	0.9427	0.9431	0.9287	0.8918
56	0.5521	0.9141	0.9198	0.9243	0.9275	0.9317	0.9355	0.9659	0.9442	0.9447	0.9313	0.8962
57	0.5625	0.9148	0.9205	0.9249	0.9280	0.9323	0.9361	0.9673	0.9461	0.9464	0.9346	0.9019
58	0.5729	0.9158	0.9214	0.9258	0.9289	0.9332	0.9373	0.9697	0.9491	0.9493	0.9399	0.9107
59	0.5833	0.9167	0.9223	0.9267	0.9297	0.9341	0.9382	0.9715	0.9514	0.9515	0.9437	0.9171
60	0.5938	0.9180	0.9236	0.9279	0.9309	0.9353	0.9394	0.9734	0.9545	0.9542	0.9482	0.9245
61	0.6042	0.9194	0.9249	0.9292	0.9321	0.9366	0.9407	0.9754	0.9575	0.9569	0.9528	0.9321
62	0.6146	0.9205	0.9260	0.9301	0.9330	0.9375	0.9415	0.9767	0.9594	0.9583	0.9555	0.9368
63	0.6250	0.9215	0.9269	0.9310	0.9339	0.9384	0.9424	0.9779	0.9614	0.9600	0.9582	0.9412
64	0.6354	0.9223	0.9277	0.9319	0.9348	0.9393	0.9433	0.9792	0.9636	0.9620	0.9613	0.9463
65	0.6458	0.9236	0.9290	0.9331	0.9361	0.9406	0.9446	0.9806	0.9662	0.9644	0.9647	0.9516
66	0.6563	0.9251	0.9306	0.9347	0.9376	0.9421	0.9460	0.9821	0.9690	0.9664	0.9678	0.9566
67	0.6667	0.9262	0.9316	0.9357	0.9386	0.9432	0.9469	0.9834	0.9710	0.9676	0.9702	0.9610
68	0.6771	0.9271	0.9325	0.9365	0.9394	0.9441	0.9477	0.9845	0.9728	0.9689	0.9724	0.9650
69	0.6875	0.9277	0.9331	0.9370	0.9400	0.9446	0.9481	0.9851	0.9737	0.9692	0.9732	0.9667
70	0.6979	0.9285	0.9338	0.9378	0.9407	0.9454	0.9488	0.9859	0.9751	0.9701	0.9748	0.9694
71	0.7083	0.9292	0.9346	0.9385	0.9415	0.9462	0.9495	0.9868	0.9765	0.9711	0.9764	0.9726
72	0.7188	0.9311	0.9364	0.9404	0.9434	0.9482	0.9513	0.9886	0.9799	0.9732	0.9794	0.9774
73	0.7292	0.9332	0.9387	0.9427	0.9458	0.9506	0.9534	0.9907	0.9838	0.9755	0.9826	0.9826
74	0.7396	0.9349	0.9404	0.9444	0.9475	0.9524	0.9550	0.9923	0.9868	0.9770	0.9850	0.9871
75	0.7500	0.9366	0.9421	0.9461	0.9493	0.9542	0.9565	0.9939	0.9899	0.9786	0.9876	0.9919
76	0.7604	0.9383	0.9438	0.9478	0.9511	0.9561	0.9581	0.9956	0.9930	0.9802	0.9902	0.9967
77	0.7708	0.9409	0.9465	0.9505	0.9539	0.9590	0.9606	0.9980	0.9974	0.9829	0.9939	1.0033
78	0.7812	0.9445	0.9502	0.9543	0.9578	0.9630	0.9643	1.0014	1.0035	0.9868	0.9989	1.0114
79	0.7917	0.9471	0.9530	0.9571	0.9608	0.9660	0.9670	1.0038	1.0081	0.9895	1.0022	1.0165
80	0.8021	0.9502	0.9563	0.9606	0.9645	0.9698	0.9705	1.0067	1.0135	0.9922	1.0055	1.0219
81	0.8125	0.9538	0.9601	0.9645	0.9686	0.9741	0.9743	1.0100	1.0194	0.9949	1.0088	1.0276
82	0.8229	0.9570	0.9636	0.9681	0.9724	0.9780	0.9780	1.0131	1.0251	0.9981	1.0123	1.0322
83	0.8333	0.9591	0.9659	0.9705	0.9750	0.9806	0.9805	1.0152	1.0284	1.0000	1.0143	1.0351
84	0.8437	0.9608	0.9677	0.9724	0.9771	0.9827	0.9825	1.0170	1.0310	1.0015	1.0159	1.0373
85	0.8542	0.9616	0.9686	0.9733	0.9781	0.9838	0.9835	1.0179	1.0319	1.0018	1.0161	1.0384
86	0.8646	0.9623	0.9694	0.9741	0.9790	0.9848	0.9844	1.0188	1.0325	1.0017	1.0161	1.0394
87	0.8750	0.9637	0.9709	0.9758	0.9808	0.9867	0.9861	1.0204	1.0346	1.0024	1.0169	1.0413
88	0.8854	0.9646	0.9719	0.9769	0.9820	0.9880	0.9874	1.0218	1.0360	1.0029	1.0177	1.0428
89	0.8958	0.9653	0.9728	0.9778	0.9830	0.9891	0.9885	1.0230	1.0372	1.0031	1.0183	1.0441
90	0.9062	0.9660	0.9736	0.9786	0.9840	0.9901	0.9896	1.0242	1.0383	1.0033	1.0189	1.0454
91	0.9167	0.9667	0.9744	0.9796	0.9850	0.9912	0.9907	1.0255	1.0394	1.0037	1.0195	1.0467
92	0.9271	0.9676	0.9754	0.9807	0.9862	0.9926	0.9922	1.0276	1.0416	1.0047	1.0216	1.0487
93	0.9375	0.9681	0.9760	0.9813	0.9870	0.9934	0.9932	1.0290	1.0428	1.0050	1.0227	1.0502
94	0.9479	0.9685	0.9766	0.9819	0.9877	0.9942	0.9941	1.0303	1.0438	1.0052	1.0236	1.0516
95	0.9583	0.9684	0.9766	0.9820	0.9878	0.9944	0.9944	1.0313	1.0442	1.0052	1.0245	1.0534
96	0.9687	0.9683	0.9764	0.9819	0.9877	0.9945	0.9946	1.0323	1.0444	1.0051	1.0254	1.0554
97	0.9792	0.9685	0.9768	0.9823	0.9882	0.9951	0.9954	1.0338	1.0456	1.0058	1.0272	1.0577
98	0.9896	0.9687	0.9770	0.9825	0.9885	0.9955	0.9961	1.0352	1.0465	1.0063	1.0286	1.0600
99	1.0000	0.9692	0.9775	0.9832	0.9893	0.9963	0.9972	1.0366	1.0482	1.0079	1.0309	1.0623
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

5		1.0651	0.59901	0.46609								
		Upleg velocity (m/s). Normalised conductivity										
Point no.	y/D	6.0	5.2	4.7	4.2	3.9	3.6	3.3	2.9	2.5	2.0	1.2
1												
2												
3	0.0000	0.2895	0.2758	0.2696	0.2548	0.2674	0.2751	0.3721	0.4882	0.4547	0.6383	0.9879
4	0.0104	0.2903	0.2766	0.2704	0.2553	0.2676	0.2744	0.3699	0.4865	0.4514	0.6341	0.9792
5	0.0208	0.2910	0.2773	0.2711	0.2557	0.2678	0.2736	0.3677	0.4846	0.4480	0.6297	0.9702
6	0.0313	0.2918	0.2780	0.2718	0.2562	0.2681	0.2729	0.3655	0.4827	0.4447	0.6252	0.9612
7	0.0417	0.2925	0.2787	0.2724	0.2566	0.2683	0.2721	0.3632	0.4807	0.4412	0.6207	0.9522
8	0.0521	0.2934	0.2796	0.2734	0.2574	0.2687	0.2719	0.3622	0.4795	0.4390	0.6182	0.9463
9	0.0625	0.2942	0.2804	0.2739	0.2575	0.2681	0.2699	0.3566	0.4724	0.4311	0.6053	0.9238
10	0.0729	0.2949	0.2810	0.2743	0.2574	0.2671	0.2674	0.3497	0.4638	0.4218	0.5897	0.8970
11	0.0833	0.2956	0.2817	0.2747	0.2574	0.2662	0.2650	0.3431	0.4557	0.4128	0.5749	0.8715
12	0.0938	0.2963	0.2824	0.2752	0.2575	0.2654	0.2632	0.3379	0.4486	0.4052	0.5623	0.8497
13	0.1042	0.2970	0.2830	0.2755	0.2574	0.2642	0.2607	0.3309	0.4386	0.3955	0.5453	0.8210
14	0.1146	0.2977	0.2837	0.2759	0.2573	0.2630	0.2583	0.3238	0.4285	0.3859	0.5283	0.7923
15	0.1250	0.2983	0.2843	0.2760	0.2571	0.2616	0.2557	0.3164	0.4175	0.3761	0.5102	0.7615
16	0.1354	0.2989	0.2848	0.2762	0.2569	0.2603	0.2537	0.3101	0.4075	0.3676	0.4943	0.7342
17	0.1458	0.2994	0.2853	0.2765	0.2571	0.2598	0.2528	0.3069	0.4018	0.3630	0.4855	0.7193
18	0.1563	0.3001	0.2860	0.2771	0.2575	0.2597	0.2528	0.3057	0.3978	0.3604	0.4801	0.7092
19	0.1667	0.3006	0.2865	0.2773	0.2576	0.2590	0.2516	0.3014	0.3906	0.3545	0.4691	0.6908
20	0.1771	0.3009	0.2867	0.2771	0.2569	0.2569	0.2480	0.2916	0.3780	0.3432	0.4484	0.6582
21	0.1875	0.3015	0.2873	0.2775	0.2572	0.2567	0.2476	0.2892	0.3733	0.3397	0.4416	0.6468
22	0.1979	0.3022	0.2881	0.2783	0.2580	0.2573	0.2487	0.2902	0.3721	0.3399	0.4413	0.6452
23	0.2083	0.3030	0.2889	0.2790	0.2588	0.2579	0.2498	0.2912	0.3709	0.3401	0.4409	0.6435
24	0.2188	0.3038	0.2897	0.2798	0.2596	0.2585	0.2509	0.2922	0.3696	0.3404	0.4406	0.6419
25	0.2292	0.3053	0.2913	0.2815	0.2616	0.2606	0.2545	0.2980	0.3722	0.3455	0.4484	0.6517
26	0.2396	0.3088	0.2950	0.2856	0.2662	0.2657	0.2621	0.3097	0.3803	0.3565	0.4677	0.6801
27	0.2500	0.3125	0.2990	0.2904	0.2721	0.2732	0.2748	0.3335	0.3997	0.3797	0.5076	0.7388
28	0.2604	0.3157	0.3025	0.2945	0.2770	0.2795	0.2850	0.3525	0.4154	0.3981	0.5398	0.7868
29	0.2708	0.3175	0.3044	0.2966	0.2792	0.2819	0.2882	0.3566	0.4184	0.4017	0.5468	0.7983
30	0.2813	0.3187	0.3055	0.2976	0.2802	0.2822	0.2879	0.3526	0.4132	0.3971	0.5392	0.7867
31	0.2917	0.3203	0.3071	0.2989	0.2816	0.2823	0.2865	0.3427	0.4020	0.3869	0.5215	0.7585
32	0.3021	0.3221	0.3088	0.3002	0.2830	0.2823	0.2848	0.3308	0.3888	0.3747	0.5004	0.7248
33	0.3125	0.3238	0.3106	0.3015	0.2845	0.2823	0.2830	0.3190	0.3757	0.3625	0.4793	0.6911
34	0.3229	0.3266	0.3133	0.3036	0.2867	0.2825	0.2804	0.3016	0.3566	0.3447	0.4488	0.6437
35	0.3333	0.3300	0.3166	0.3062	0.2894	0.2827	0.2773	0.2807	0.3338	0.3232	0.4121	0.5872
36	0.3438	0.3307	0.3173	0.3067	0.2906	0.2830	0.2766	0.2713	0.3236	0.3135	0.3954	0.5580
37	0.3542	0.3315	0.3180	0.3070	0.2914	0.2826	0.2745	0.2586	0.3104	0.3008	0.3728	0.5205
38	0.3646	0.3322	0.3187	0.3074	0.2922	0.2821	0.2724	0.2459	0.2971	0.2881	0.3503	0.4829
39	0.3750	0.3329	0.3194	0.3077	0.2930	0.2817	0.2702	0.2332	0.2838	0.2754	0.3278	0.4453
40	0.3854	0.3337	0.3201	0.3081	0.2938	0.2813	0.2681	0.2205	0.2706	0.2627	0.3053	0.4077
41	0.3958	0.3341	0.3205	0.3084	0.2945	0.2815	0.2676	0.2144	0.2642	0.2567	0.2945	0.3893
42	0.4063	0.3342	0.3206	0.3085	0.2950	0.2820	0.2681	0.2129	0.2629	0.2556	0.2921	0.3846
43	0.4167	0.3343	0.3208	0.3087	0.2957	0.2828	0.2691	0.2126	0.2628	0.2558	0.2921	0.3837
44	0.4271	0.3339	0.3204	0.3086	0.2961	0.2836	0.2704	0.2130	0.2633	0.2571	0.2934	0.3846
45	0.4375	0.3333	0.3200	0.3085	0.2968	0.2850	0.2728	0.2163	0.2666	0.2614	0.2999	0.3937
46	0.4479	0.3329	0.3197	0.3084	0.2975	0.2863	0.2750	0.2183	0.2686	0.2639	0.3036	0.3984
47	0.4583	0.3321	0.3191	0.3082	0.2981	0.2877	0.2776	0.2221	0.2723	0.2690	0.3111	0.4090
48	0.4688	0.3314	0.3184	0.3078	0.2985	0.2888	0.2796	0.2243	0.2745	0.2721	0.3152	0.4142
49	0.4792	0.3302	0.3174	0.3070	0.2983	0.2888	0.2799	0.2227	0.2725	0.2703	0.3114	0.4063
50	0.4896	0.3294	0.3167	0.3065	0.2984	0.2893	0.2808	0.2228	0.2725	0.2708	0.3111	0.4046

51	0.5000	0.3287	0.3162	0.3062	0.2987	0.2899	0.2819	0.2232	0.2730	0.2720	0.3117	0.4045
52	0.5104	0.3279	0.3154	0.3056	0.2983	0.2895	0.2816	0.2212	0.2707	0.2699	0.3072	0.3964
53	0.5208	0.3268	0.3144	0.3047	0.2976	0.2889	0.2810	0.2195	0.2685	0.2679	0.3033	0.3896
54	0.5313	0.3257	0.3134	0.3037	0.2967	0.2880	0.2801	0.2175	0.2657	0.2650	0.2984	0.3813
55	0.5417	0.3248	0.3125	0.3029	0.2960	0.2871	0.2790	0.2152	0.2625	0.2617	0.2928	0.3718
56	0.5521	0.3240	0.3117	0.3020	0.2952	0.2862	0.2780	0.2129	0.2593	0.2584	0.2871	0.3624
57	0.5625	0.3225	0.3103	0.3008	0.2941	0.2850	0.2767	0.2097	0.2553	0.2547	0.2799	0.3503
58	0.5729	0.3203	0.3082	0.2989	0.2922	0.2829	0.2743	0.2047	0.2489	0.2484	0.2687	0.3314
59	0.5833	0.3184	0.3063	0.2970	0.2905	0.2810	0.2723	0.2009	0.2439	0.2438	0.2605	0.3176
60	0.5938	0.3155	0.3036	0.2944	0.2879	0.2784	0.2696	0.1967	0.2374	0.2379	0.2508	0.3016
61	0.6042	0.3126	0.3008	0.2917	0.2853	0.2757	0.2669	0.1926	0.2309	0.2321	0.2410	0.2855
62	0.6146	0.3103	0.2985	0.2896	0.2833	0.2738	0.2651	0.1896	0.2268	0.2292	0.2352	0.2753
63	0.6250	0.3082	0.2965	0.2876	0.2814	0.2718	0.2633	0.1871	0.2225	0.2256	0.2294	0.2658
64	0.6354	0.3064	0.2947	0.2859	0.2796	0.2699	0.2612	0.1843	0.2179	0.2211	0.2226	0.2548
65	0.6458	0.3037	0.2920	0.2831	0.2769	0.2671	0.2585	0.1812	0.2122	0.2161	0.2154	0.2435
66	0.6563	0.3003	0.2886	0.2799	0.2736	0.2639	0.2555	0.1781	0.2063	0.2118	0.2088	0.2328
67	0.6667	0.2980	0.2864	0.2777	0.2715	0.2616	0.2536	0.1753	0.2019	0.2092	0.2037	0.2233
68	0.6771	0.2961	0.2845	0.2759	0.2696	0.2597	0.2519	0.1729	0.1980	0.2065	0.1989	0.2147
69	0.6875	0.2948	0.2833	0.2748	0.2685	0.2585	0.2510	0.1717	0.1961	0.2058	0.1972	0.2112
70	0.6979	0.2931	0.2817	0.2731	0.2669	0.2569	0.2495	0.1699	0.1931	0.2038	0.1938	0.2052
71	0.7083	0.2915	0.2800	0.2716	0.2652	0.2551	0.2480	0.1680	0.1900	0.2016	0.1902	0.1985
72	0.7188	0.2876	0.2760	0.2675	0.2611	0.2509	0.2442	0.1641	0.1828	0.1972	0.1838	0.1882
73	0.7292	0.2829	0.2712	0.2627	0.2561	0.2457	0.2396	0.1597	0.1744	0.1923	0.1770	0.1770
74	0.7396	0.2793	0.2676	0.2591	0.2523	0.2418	0.2363	0.1563	0.1681	0.1890	0.1718	0.1673
75	0.7500	0.2757	0.2639	0.2554	0.2485	0.2379	0.2330	0.1527	0.1614	0.1856	0.1663	0.1570
76	0.7604	0.2721	0.2602	0.2517	0.2447	0.2339	0.2296	0.1492	0.1548	0.1821	0.1607	0.1467
77	0.7708	0.2665	0.2545	0.2459	0.2387	0.2277	0.2242	0.1439	0.1452	0.1764	0.1527	0.1326
78	0.7812	0.2588	0.2465	0.2378	0.2301	0.2190	0.2163	0.1367	0.1322	0.1681	0.1421	0.1152
79	0.7917	0.2533	0.2406	0.2318	0.2238	0.2126	0.2104	0.1315	0.1223	0.1622	0.1350	0.1043
80	0.8021	0.2465	0.2334	0.2243	0.2159	0.2044	0.2031	0.1253	0.1107	0.1564	0.1279	0.0927
81	0.8125	0.2389	0.2253	0.2159	0.2071	0.1953	0.1949	0.1182	0.0980	0.1506	0.1208	0.0805
82	0.8229	0.2319	0.2178	0.2081	0.1988	0.1869	0.1870	0.1116	0.0858	0.1439	0.1133	0.0706
83	0.8333	0.2274	0.2129	0.2030	0.1933	0.1813	0.1816	0.1071	0.0787	0.1397	0.1090	0.0644
84	0.8437	0.2238	0.2090	0.1990	0.1889	0.1767	0.1772	0.1032	0.0732	0.1365	0.1056	0.0596
85	0.8542	0.2221	0.2071	0.1969	0.1867	0.1744	0.1751	0.1013	0.0712	0.1358	0.1051	0.0573
86	0.8646	0.2206	0.2054	0.1952	0.1847	0.1723	0.1732	0.0993	0.0699	0.1360	0.1051	0.0551
87	0.8750	0.2177	0.2021	0.1917	0.1810	0.1683	0.1695	0.0959	0.0654	0.1345	0.1034	0.0511
88	0.8854	0.2157	0.1999	0.1893	0.1783	0.1655	0.1667	0.0929	0.0624	0.1335	0.1017	0.0478
89	0.8958	0.2142	0.1981	0.1874	0.1762	0.1632	0.1644	0.0903	0.0599	0.1330	0.1004	0.0451
90	0.9062	0.2127	0.1964	0.1855	0.1740	0.1609	0.1621	0.0878	0.0575	0.1326	0.0991	0.0423
91	0.9167	0.2111	0.1946	0.1835	0.1719	0.1585	0.1597	0.0850	0.0551	0.1317	0.0978	0.0395
92	0.9271	0.2093	0.1924	0.1812	0.1692	0.1556	0.1564	0.0805	0.0504	0.1296	0.0933	0.0352
93	0.9375	0.2082	0.1911	0.1797	0.1675	0.1538	0.1543	0.0775	0.0478	0.1289	0.0910	0.0320
94	0.9479	0.2072	0.1899	0.1784	0.1660	0.1521	0.1524	0.0747	0.0457	0.1285	0.0890	0.0290
95	0.9583	0.2074	0.1900	0.1784	0.1659	0.1517	0.1518	0.0725	0.0448	0.1285	0.0871	0.0251
96	0.9687	0.2077	0.1902	0.1786	0.1660	0.1516	0.1513	0.0704	0.0444	0.1287	0.0852	0.0208
97	0.9792	0.2072	0.1895	0.1778	0.1650	0.1503	0.1495	0.0672	0.0418	0.1272	0.0813	0.0159
98	0.9896	0.2069	0.1891	0.1772	0.1643	0.1493	0.1481	0.0642	0.0399	0.1262	0.0783	0.0109
99	1.0000	0.2058	0.1879	0.1758	0.1627	0.1476	0.1457	0.0611	0.0363	0.1227	0.0734	0.0060
100												
101												

d56_k10ss1sc20

-1		0.93272	0.61659	0.31613				
		Upleg velocity (m/s)						
Point no.	y/d	4.7	3.6	2.9	2.4	2.0	1.6	1.5
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.8010	0.6964	0.6996	0.7039	0.6501	0.6499	0.6421
3	0.0000	0.8005	0.6945	0.6978	0.7019	0.6469	0.6464	0.6384
4	0.0104	0.7996	0.6920	0.6950	0.6984	0.6422	0.6409	0.6326
5	0.0208	0.7986	0.6896	0.6923	0.6948	0.6376	0.6355	0.6269
6	0.0313	0.7976	0.6879	0.6910	0.6931	0.6350	0.6325	0.6238
7	0.0417	0.7966	0.6865	0.6901	0.6920	0.6331	0.6304	0.6214
8	0.0521	0.7956	0.6850	0.6892	0.6909	0.6311	0.6282	0.6190
9	0.0625	0.7946	0.6836	0.6884	0.6898	0.6292	0.6260	0.6166
10	0.0729	0.7937	0.6841	0.6902	0.6919	0.6315	0.6288	0.6193
11	0.0833	0.7929	0.6868	0.6950	0.6978	0.6385	0.6370	0.6276
12	0.0938	0.7922	0.6895	0.6998	0.7036	0.6455	0.6452	0.6360
13	0.1042	0.7912	0.6915	0.7035	0.7076	0.6507	0.6508	0.6417
14	0.1146	0.7898	0.6931	0.7053	0.7083	0.6534	0.6524	0.6433
15	0.1250	0.7893	0.6956	0.7081	0.7106	0.6578	0.6561	0.6470
16	0.1354	0.7893	0.6985	0.7118	0.7148	0.6636	0.6624	0.6536
17	0.1458	0.7893	0.7014	0.7156	0.7191	0.6694	0.6688	0.6602
18	0.1563	0.7894	0.7045	0.7194	0.7234	0.6753	0.6752	0.6668
19	0.1667	0.7897	0.7080	0.7234	0.7280	0.6816	0.6819	0.6738
20	0.1771	0.7898	0.7112	0.7273	0.7323	0.6874	0.6883	0.6804
21	0.1875	0.7896	0.7133	0.7299	0.7353	0.6914	0.6927	0.6849
22	0.1979	0.7893	0.7137	0.7309	0.7364	0.6926	0.6940	0.6862
23	0.2083	0.7885	0.7132	0.7299	0.7346	0.6909	0.6915	0.6835
24	0.2188	0.7876	0.7128	0.7284	0.7317	0.6886	0.6881	0.6799
25	0.2292	0.7871	0.7131	0.7283	0.7310	0.6884	0.6872	0.6790
26	0.2396	0.7856	0.7137	0.7277	0.7288	0.6866	0.6838	0.6753
27	0.2500	0.7839	0.7143	0.7269	0.7261	0.6844	0.6796	0.6708
28	0.2604	0.7813	0.7106	0.7200	0.7157	0.6737	0.6656	0.6561
29	0.2708	0.7792	0.7063	0.7128	0.7055	0.6628	0.6520	0.6419
30	0.2813	0.7791	0.7100	0.7139	0.7050	0.6645	0.6517	0.6416
31	0.2917	0.7791	0.7153	0.7180	0.7086	0.6696	0.6560	0.6460
32	0.3021	0.7800	0.7241	0.7265	0.7179	0.6813	0.6679	0.6583
33	0.3125	0.7810	0.7329	0.7350	0.7272	0.6932	0.6800	0.6707
34	0.3229	0.7819	0.7417	0.7435	0.7365	0.7050	0.6920	0.6830
35	0.3333	0.7829	0.7495	0.7511	0.7447	0.7156	0.7028	0.6942
36	0.3438	0.7843	0.7594	0.7603	0.7548	0.7287	0.7162	0.7081
37	0.3542	0.7858	0.7670	0.7665	0.7614	0.7381	0.7254	0.7179
38	0.3646	0.7874	0.7756	0.7743	0.7700	0.7496	0.7373	0.7304
39	0.3750	0.7892	0.7850	0.7834	0.7804	0.7630	0.7514	0.7452
40	0.3854	0.7901	0.7897	0.7874	0.7847	0.7689	0.7574	0.7515
41	0.3958	0.7903	0.7906	0.7871	0.7840	0.7687	0.7567	0.7508
42	0.4063	0.7907	0.7923	0.7885	0.7854	0.7708	0.7589	0.7531
43	0.4167	0.7911	0.7941	0.7898	0.7869	0.7730	0.7611	0.7554
44	0.4271	0.7911	0.7929	0.7877	0.7843	0.7701	0.7580	0.7521
45	0.4375	0.7913	0.7921	0.7857	0.7816	0.7675	0.7549	0.7489
46	0.4479	0.7917	0.7922	0.7846	0.7800	0.7663	0.7534	0.7474
47	0.4583	0.7917	0.7903	0.7815	0.7761	0.7621	0.7487	0.7425
48	0.4688	0.7922	0.7904	0.7807	0.7750	0.7615	0.7479	0.7418
49	0.4792	0.7930	0.7923	0.7824	0.7768	0.7644	0.7511	0.7453

50	0.4896	0.7933	0.7920	0.7819	0.7760	0.7640	0.7507	0.7451
51	0.5000	0.7935	0.7916	0.7814	0.7752	0.7635	0.7503	0.7447
52	0.5104	0.7941	0.7931	0.7835	0.7776	0.7667	0.7539	0.7486
53	0.5208	0.7945	0.7939	0.7848	0.7790	0.7686	0.7562	0.7511
54	0.5313	0.7950	0.7950	0.7865	0.7809	0.7712	0.7591	0.7543
55	0.5417	0.7955	0.7966	0.7888	0.7835	0.7746	0.7629	0.7584
56	0.5521	0.7960	0.7982	0.7911	0.7861	0.7779	0.7666	0.7624
57	0.5625	0.7970	0.8010	0.7955	0.7910	0.7842	0.7737	0.7702
58	0.5729	0.7980	0.8036	0.7997	0.7959	0.7902	0.7807	0.7777
59	0.5833	0.7988	0.8057	0.8031	0.7997	0.7948	0.7861	0.7836
60	0.5938	0.7999	0.8080	0.8070	0.8040	0.8000	0.7921	0.7902
61	0.6042	0.8010	0.8108	0.8114	0.8088	0.8059	0.7989	0.7977
62	0.6146	0.8017	0.8114	0.8131	0.8108	0.8079	0.8015	0.8007
63	0.6250	0.8021	0.8116	0.8143	0.8121	0.8092	0.8032	0.8027
64	0.6354	0.8029	0.8137	0.8174	0.8154	0.8132	0.8077	0.8077
65	0.6458	0.8037	0.8158	0.8204	0.8188	0.8172	0.8123	0.8127
66	0.6563	0.8048	0.8180	0.8237	0.8223	0.8212	0.8169	0.8178
67	0.6667	0.8061	0.8210	0.8282	0.8270	0.8267	0.8232	0.8248
68	0.6771	0.8066	0.8219	0.8298	0.8289	0.8286	0.8255	0.8274
69	0.6875	0.8072	0.8228	0.8314	0.8307	0.8306	0.8278	0.8301
70	0.6979	0.8078	0.8237	0.8329	0.8324	0.8322	0.8299	0.8325
71	0.7083	0.8086	0.8251	0.8353	0.8353	0.8352	0.8333	0.8365
72	0.7188	0.8095	0.8265	0.8376	0.8382	0.8382	0.8368	0.8405
73	0.7292	0.8106	0.8282	0.8401	0.8407	0.8406	0.8397	0.8440
74	0.7396	0.8120	0.8301	0.8429	0.8436	0.8434	0.8430	0.8479
75	0.7500	0.8139	0.8334	0.8471	0.8481	0.8472	0.8476	0.8536
76	0.7604	0.8158	0.8367	0.8515	0.8526	0.8513	0.8525	0.8595
77	0.7708	0.8178	0.8400	0.8559	0.8570	0.8554	0.8573	0.8655
78	0.7812	0.8213	0.8458	0.8621	0.8627	0.8607	0.8638	0.8732
79	0.7917	0.8252	0.8518	0.8682	0.8681	0.8659	0.8702	0.8808
80	0.8021	0.8296	0.8587	0.8743	0.8730	0.8705	0.8760	0.8878
81	0.8125	0.8340	0.8656	0.8804	0.8779	0.8751	0.8819	0.8947
82	0.8229	0.8370	0.8705	0.8843	0.8810	0.8777	0.8854	0.8991
83	0.8333	0.8397	0.8750	0.8878	0.8836	0.8798	0.8883	0.9029
84	0.8437	0.8436	0.8808	0.8918	0.8866	0.8823	0.8918	0.9074
85	0.8542	0.8449	0.8822	0.8920	0.8872	0.8824	0.8923	0.9084
86	0.8646	0.8461	0.8837	0.8921	0.8878	0.8825	0.8928	0.9094
87	0.8750	0.8476	0.8853	0.8924	0.8886	0.8828	0.8935	0.9105
88	0.8854	0.8497	0.8880	0.8932	0.8900	0.8836	0.8948	0.9125
89	0.8958	0.8514	0.8904	0.8938	0.8906	0.8840	0.8960	0.9143
90	0.9062	0.8536	0.8933	0.8948	0.8920	0.8850	0.8975	0.9165
91	0.9167	0.8551	0.8954	0.8948	0.8921	0.8850	0.8984	0.9179
92	0.9271	0.8562	0.8970	0.8943	0.8919	0.8850	0.8998	0.9196
93	0.9375	0.8571	0.8982	0.8933	0.8917	0.8852	0.9012	0.9214
94	0.9479	0.8581	0.8994	0.8917	0.8914	0.8855	0.9029	0.9235
95	0.9583	0.8592	0.9007	0.8902	0.8911	0.8858	0.9047	0.9257
96	0.9687	0.8602	0.9018	0.8888	0.8909	0.8862	0.9062	0.9277
97	0.9792	0.8607	0.9025	0.8880	0.8909	0.8868	0.9078	0.9294
98	0.9896	0.8610	0.9031	0.8878	0.8909	0.8877	0.9095	0.9310
99	1.0000	0.8613	0.9037	0.8875	0.8909	0.8886	0.9113	0.9327
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		0.93272	0.61659	0.31613				
		Upleg velocity (m/s). Normalised conductivities						
Point no.	y/D	4.7	3.6	2.9	2.4	2.0	1.6	1.5
1								
2		0.4167	0.7476	0.7376	0.7240	0.8940	0.8948	0.9194
3	0.0000	0.4183	0.7534	0.7432	0.7300	0.9041	0.9058	0.9311
4	0.0104	0.4212	0.7613	0.7520	0.7414	0.9189	0.9233	0.9495
5	0.0208	0.4242	0.7691	0.7606	0.7527	0.9337	0.9403	0.9673
6	0.0313	0.4274	0.7745	0.7647	0.7581	0.9419	0.9496	0.9774
7	0.0417	0.4306	0.7790	0.7674	0.7616	0.9479	0.9565	0.9849
8	0.0521	0.4338	0.7835	0.7702	0.7651	0.9540	0.9633	0.9924
9	0.0625	0.4371	0.7880	0.7729	0.7686	0.9600	0.9702	1.0000
10	0.0729	0.4399	0.7864	0.7671	0.7616	0.9528	0.9614	0.9914
11	0.0833	0.4422	0.7779	0.7519	0.7431	0.9307	0.9355	0.9650
12	0.0938	0.4446	0.7694	0.7367	0.7246	0.9086	0.9096	0.9387
13	0.1042	0.4478	0.7629	0.7251	0.7121	0.8920	0.8917	0.9205
14	0.1146	0.4522	0.7580	0.7194	0.7101	0.8834	0.8867	0.9156
15	0.1250	0.4537	0.7502	0.7106	0.7027	0.8697	0.8751	0.9037
16	0.1354	0.4537	0.7410	0.6988	0.6892	0.8513	0.8551	0.8830
17	0.1458	0.4537	0.7318	0.6868	0.6757	0.8329	0.8348	0.8621
18	0.1563	0.4532	0.7218	0.6748	0.6621	0.8143	0.8148	0.8412
19	0.1667	0.4524	0.7110	0.6620	0.6476	0.7945	0.7933	0.8190
20	0.1771	0.4520	0.7009	0.6499	0.6340	0.7759	0.7731	0.7981
21	0.1875	0.4526	0.6942	0.6414	0.6246	0.7633	0.7594	0.7840
22	0.1979	0.4535	0.6927	0.6385	0.6210	0.7596	0.7552	0.7800
23	0.2083	0.4564	0.6943	0.6414	0.6269	0.7649	0.7632	0.7885
24	0.2188	0.4591	0.6958	0.6464	0.6358	0.7721	0.7739	0.7997
25	0.2292	0.4608	0.6946	0.6468	0.6381	0.7729	0.7766	0.8026
26	0.2396	0.4653	0.6928	0.6487	0.6450	0.7785	0.7873	0.8142
27	0.2500	0.4709	0.6908	0.6512	0.6535	0.7856	0.8006	0.8286
28	0.2604	0.4791	0.7025	0.6730	0.6866	0.8194	0.8449	0.8751
29	0.2708	0.4855	0.7164	0.6957	0.7187	0.8537	0.8880	0.9201
30	0.2813	0.4861	0.7046	0.6922	0.7204	0.8486	0.8891	0.9209
31	0.2917	0.4860	0.6879	0.6794	0.7089	0.8324	0.8754	0.9069
32	0.3021	0.4830	0.6601	0.6525	0.6797	0.7952	0.8377	0.8681
33	0.3125	0.4800	0.6320	0.6253	0.6501	0.7576	0.7994	0.8288
34	0.3229	0.4770	0.6042	0.5984	0.6208	0.7204	0.7616	0.7899
35	0.3333	0.4740	0.5797	0.5745	0.5946	0.6868	0.7273	0.7545
36	0.3438	0.4694	0.5483	0.5454	0.5627	0.6453	0.6850	0.7106
37	0.3542	0.4648	0.5241	0.5258	0.5420	0.6158	0.6558	0.6795
38	0.3646	0.4597	0.4970	0.5012	0.5148	0.5794	0.6183	0.6401
39	0.3750	0.4541	0.4673	0.4724	0.4820	0.5369	0.5735	0.5932
40	0.3854	0.4513	0.4523	0.4597	0.4684	0.5182	0.5545	0.5733
41	0.3958	0.4507	0.4497	0.4605	0.4705	0.5189	0.5567	0.5756
42	0.4063	0.4493	0.4442	0.4562	0.4659	0.5121	0.5497	0.5683
43	0.4167	0.4479	0.4386	0.4520	0.4613	0.5054	0.5428	0.5609
44	0.4271	0.4479	0.4422	0.4586	0.4696	0.5143	0.5528	0.5715
45	0.4375	0.4473	0.4448	0.4651	0.4781	0.5226	0.5625	0.5815
46	0.4479	0.4462	0.4447	0.4685	0.4830	0.5264	0.5673	0.5863
47	0.4583	0.4460	0.4504	0.4785	0.4955	0.5397	0.5822	0.6017
48	0.4688	0.4446	0.4501	0.4808	0.4990	0.5417	0.5846	0.6039
49	0.4792	0.4420	0.4443	0.4756	0.4934	0.5325	0.5745	0.5927
50	0.4896	0.4412	0.4453	0.4771	0.4957	0.5337	0.5756	0.5936

51	0.5000	0.4404	0.4463	0.4788	0.4982	0.5352	0.5771	0.5949
52	0.5104	0.4386	0.4417	0.4721	0.4908	0.5251	0.5657	0.5824
53	0.5208	0.4372	0.4392	0.4680	0.4863	0.5190	0.5585	0.5745
54	0.5313	0.4356	0.4355	0.4625	0.4802	0.5109	0.5492	0.5644
55	0.5417	0.4340	0.4305	0.4552	0.4720	0.5003	0.5373	0.5515
56	0.5521	0.4324	0.4255	0.4479	0.4639	0.4896	0.5254	0.5386
57	0.5625	0.4293	0.4168	0.4342	0.4482	0.4700	0.5029	0.5142
58	0.5729	0.4262	0.4084	0.4207	0.4329	0.4510	0.4810	0.4903
59	0.5833	0.4235	0.4019	0.4100	0.4207	0.4362	0.4639	0.4716
60	0.5938	0.4203	0.3944	0.3978	0.4072	0.4197	0.4449	0.4508
61	0.6042	0.4165	0.3856	0.3839	0.3919	0.4011	0.4233	0.4272
62	0.6146	0.4146	0.3839	0.3783	0.3858	0.3948	0.4152	0.4177
63	0.6250	0.4131	0.3830	0.3745	0.3815	0.3908	0.4098	0.4112
64	0.6354	0.4106	0.3764	0.3649	0.3710	0.3781	0.3954	0.3955
65	0.6458	0.4080	0.3697	0.3553	0.3604	0.3654	0.3810	0.3798
66	0.6563	0.4048	0.3630	0.3448	0.3493	0.3529	0.3664	0.3635
67	0.6667	0.4007	0.3533	0.3306	0.3344	0.3354	0.3463	0.3414
68	0.6771	0.3989	0.3505	0.3256	0.3285	0.3293	0.3391	0.3330
69	0.6875	0.3971	0.3476	0.3205	0.3226	0.3232	0.3318	0.3246
70	0.6979	0.3953	0.3448	0.3157	0.3173	0.3179	0.3254	0.3171
71	0.7083	0.3925	0.3404	0.3083	0.3082	0.3084	0.3144	0.3045
72	0.7188	0.3897	0.3360	0.3009	0.2990	0.2989	0.3033	0.2917
73	0.7292	0.3863	0.3307	0.2930	0.2911	0.2913	0.2942	0.2808
74	0.7396	0.3820	0.3245	0.2841	0.2818	0.2827	0.2837	0.2682
75	0.7500	0.3759	0.3141	0.2708	0.2678	0.2705	0.2694	0.2504
76	0.7604	0.3698	0.3036	0.2569	0.2536	0.2575	0.2539	0.2316
77	0.7708	0.3636	0.2932	0.2430	0.2394	0.2445	0.2384	0.2128
78	0.7812	0.3524	0.2750	0.2234	0.2216	0.2278	0.2181	0.1884
79	0.7917	0.3403	0.2558	0.2040	0.2043	0.2113	0.1979	0.1643
80	0.8021	0.3263	0.2341	0.1848	0.1889	0.1968	0.1794	0.1423
81	0.8125	0.3124	0.2124	0.1656	0.1734	0.1822	0.1608	0.1201
82	0.8229	0.3028	0.1967	0.1530	0.1638	0.1740	0.1498	0.1063
83	0.8333	0.2943	0.1826	0.1422	0.1555	0.1674	0.1406	0.0943
84	0.8437	0.2820	0.1643	0.1294	0.1458	0.1596	0.1294	0.0800
85	0.8542	0.2779	0.1597	0.1290	0.1440	0.1592	0.1278	0.0769
86	0.8646	0.2739	0.1552	0.1286	0.1422	0.1590	0.1263	0.0739
87	0.8750	0.2693	0.1499	0.1276	0.1396	0.1580	0.1242	0.0702
88	0.8854	0.2628	0.1416	0.1249	0.1352	0.1554	0.1201	0.0639
89	0.8958	0.2571	0.1339	0.1232	0.1334	0.1541	0.1162	0.0584
90	0.9062	0.2503	0.1246	0.1199	0.1290	0.1511	0.1113	0.0514
91	0.9167	0.2457	0.1182	0.1200	0.1284	0.1510	0.1085	0.0469
92	0.9271	0.2421	0.1130	0.1216	0.1292	0.1508	0.1042	0.0414
93	0.9375	0.2392	0.1092	0.1249	0.1298	0.1503	0.0999	0.0359
94	0.9479	0.2359	0.1053	0.1296	0.1307	0.1493	0.0943	0.0291
95	0.9583	0.2327	0.1014	0.1344	0.1317	0.1483	0.0888	0.0223
96	0.9687	0.2294	0.0977	0.1390	0.1323	0.1473	0.0838	0.0160
97	0.9792	0.2278	0.0956	0.1413	0.1323	0.1453	0.0789	0.0107
98	0.9896	0.2269	0.0937	0.1421	0.1323	0.1424	0.0734	0.0053
99	1.0000	0.2260	0.0919	0.1429	0.1323	0.1396	0.0679	0.0000
100								
101								

d56_k10ss1sc30

-1		0.78159	0.38483	0.39676					
		Upleg velocity (m/s)							
Point no.	y/D	4.7	3.5	2.9	2.4	2.1	1.7	1.4	3.6
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.5296	0.4362	0.4445	0.4599	0.4355	0.4404	0.4375	0.4942
3	0.0000	0.5281	0.4347	0.4427	0.4580	0.4327	0.4371	0.4338	0.4924
4	0.0104	0.5261	0.4326	0.4399	0.4548	0.4286	0.4321	0.4283	0.4902
5	0.0208	0.5240	0.4306	0.4371	0.4515	0.4245	0.4269	0.4227	0.4880
6	0.0313	0.5214	0.4287	0.4347	0.4491	0.4214	0.4231	0.4186	0.4859
7	0.0417	0.5187	0.4268	0.4325	0.4469	0.4186	0.4198	0.4149	0.4838
8	0.0521	0.5160	0.4249	0.4303	0.4448	0.4158	0.4164	0.4112	0.4817
9	0.0625	0.5132	0.4230	0.4281	0.4426	0.4130	0.4131	0.4075	0.4796
10	0.0729	0.5106	0.4220	0.4273	0.4425	0.4129	0.4130	0.4073	0.4785
11	0.0833	0.5080	0.4221	0.4282	0.4445	0.4157	0.4165	0.4111	0.4785
12	0.0938	0.5054	0.4223	0.4290	0.4465	0.4184	0.4200	0.4149	0.4785
13	0.1042	0.5025	0.4218	0.4289	0.4471	0.4197	0.4215	0.4165	0.4780
14	0.1146	0.4996	0.4211	0.4273	0.4453	0.4190	0.4200	0.4149	0.4771
15	0.1250	0.4988	0.4220	0.4281	0.4461	0.4209	0.4216	0.4167	0.4779
16	0.1354	0.4986	0.4233	0.4299	0.4485	0.4242	0.4255	0.4209	0.4793
17	0.1458	0.4985	0.4247	0.4317	0.4509	0.4276	0.4295	0.4252	0.4806
18	0.1563	0.4989	0.4265	0.4340	0.4536	0.4313	0.4337	0.4298	0.4824
19	0.1667	0.4995	0.4286	0.4366	0.4568	0.4355	0.4385	0.4350	0.4844
20	0.1771	0.4998	0.4303	0.4388	0.4594	0.4391	0.4427	0.4395	0.4862
21	0.1875	0.4991	0.4309	0.4396	0.4606	0.4410	0.4448	0.4417	0.4867
22	0.1979	0.4979	0.4304	0.4392	0.4605	0.4409	0.4448	0.4416	0.4862
23	0.2083	0.4958	0.4288	0.4370	0.4578	0.4381	0.4412	0.4377	0.4845
24	0.2188	0.4940	0.4273	0.4344	0.4543	0.4347	0.4369	0.4330	0.4830
25	0.2292	0.4928	0.4267	0.4334	0.4529	0.4334	0.4351	0.4309	0.4823
26	0.2396	0.4895	0.4252	0.4307	0.4491	0.4294	0.4296	0.4246	0.4804
27	0.2500	0.4855	0.4233	0.4274	0.4445	0.4246	0.4229	0.4169	0.4779
28	0.2604	0.4796	0.4177	0.4187	0.4333	0.4126	0.4077	0.4003	0.4721
29	0.2708	0.4749	0.4124	0.4107	0.4231	0.4014	0.3940	0.3852	0.4668
30	0.2813	0.4764	0.4161	0.4131	0.4238	0.4028	0.3938	0.3848	0.4698
31	0.2917	0.4774	0.4208	0.4178	0.4273	0.4068	0.3970	0.3876	0.4734
32	0.3021	0.4803	0.4288	0.4267	0.4358	0.4164	0.4066	0.3972	0.4801
33	0.3125	0.4832	0.4368	0.4357	0.4444	0.4261	0.4164	0.4070	0.4868
34	0.3229	0.4861	0.4447	0.4446	0.4530	0.4357	0.4261	0.4168	0.4935
35	0.3333	0.4890	0.4518	0.4525	0.4607	0.4446	0.4352	0.4260	0.4995
36	0.3438	0.4937	0.4618	0.4635	0.4711	0.4565	0.4473	0.4384	0.5081
37	0.3542	0.4993	0.4714	0.4734	0.4800	0.4667	0.4575	0.4492	0.5164
38	0.3646	0.5048	0.4813	0.4841	0.4902	0.4784	0.4696	0.4618	0.5250
39	0.3750	0.5104	0.4915	0.4956	0.5015	0.4913	0.4832	0.4761	0.5339
40	0.3854	0.5132	0.4969	0.5013	0.5067	0.4973	0.4892	0.4823	0.5386
41	0.3958	0.5137	0.4984	0.5023	0.5069	0.4976	0.4889	0.4818	0.5398
42	0.4063	0.5148	0.5007	0.5046	0.5089	0.5000	0.4913	0.4843	0.5418
43	0.4167	0.5160	0.5030	0.5070	0.5110	0.5024	0.4937	0.4868	0.5438
44	0.4271	0.5153	0.5018	0.5051	0.5086	0.5001	0.4907	0.4836	0.5427
45	0.4375	0.5150	0.5016	0.5041	0.5068	0.4984	0.4884	0.4811	0.5426
46	0.4479	0.5154	0.5029	0.5045	0.5065	0.4983	0.4878	0.4804	0.5437
47	0.4583	0.5144	0.5013	0.5019	0.5032	0.4951	0.4838	0.4761	0.5423
48	0.4688	0.5150	0.5029	0.5028	0.5033	0.4956	0.4841	0.4764	0.5437

49	0.4792	0.5172	0.5073	0.5067	0.5068	0.4999	0.4887	0.4816	0.5476
50	0.4896	0.5172	0.5082	0.5071	0.5068	0.5002	0.4889	0.4819	0.5484
51	0.5000	0.5171	0.5090	0.5073	0.5066	0.5004	0.4889	0.4821	0.5491
52	0.5104	0.5185	0.5124	0.5106	0.5098	0.5042	0.4932	0.4869	0.5521
53	0.5208	0.5194	0.5147	0.5127	0.5119	0.5068	0.4962	0.4903	0.5543
54	0.5313	0.5207	0.5177	0.5154	0.5147	0.5100	0.4999	0.4945	0.5570
55	0.5417	0.5223	0.5213	0.5190	0.5182	0.5140	0.5046	0.4996	0.5602
56	0.5521	0.5239	0.5250	0.5226	0.5218	0.5180	0.5092	0.5048	0.5635
57	0.5625	0.5266	0.5311	0.5286	0.5280	0.5252	0.5176	0.5142	0.5689
58	0.5729	0.5293	0.5370	0.5344	0.5342	0.5322	0.5259	0.5236	0.5743
59	0.5833	0.5316	0.5416	0.5390	0.5391	0.5378	0.5325	0.5311	0.5785
60	0.5938	0.5342	0.5473	0.5444	0.5447	0.5443	0.5400	0.5398	0.5836
61	0.6042	0.5374	0.5542	0.5508	0.5514	0.5518	0.5490	0.5498	0.5899
62	0.6146	0.5382	0.5561	0.5525	0.5535	0.5544	0.5521	0.5539	0.5918
63	0.6250	0.5387	0.5571	0.5535	0.5549	0.5560	0.5542	0.5568	0.5929
64	0.6354	0.5412	0.5619	0.5581	0.5596	0.5612	0.5603	0.5636	0.5972
65	0.6458	0.5437	0.5668	0.5626	0.5643	0.5663	0.5664	0.5704	0.6016
66	0.6563	0.5464	0.5720	0.5675	0.5693	0.5717	0.5729	0.5778	0.6064
67	0.6667	0.5501	0.5792	0.5742	0.5762	0.5791	0.5817	0.5878	0.6130
68	0.6771	0.5515	0.5813	0.5762	0.5785	0.5816	0.5848	0.5916	0.6149
69	0.6875	0.5528	0.5833	0.5782	0.5808	0.5841	0.5879	0.5953	0.6168
70	0.6979	0.5542	0.5854	0.5802	0.5830	0.5865	0.5907	0.5989	0.6188
71	0.7083	0.5565	0.5883	0.5831	0.5865	0.5903	0.5954	0.6046	0.6216
72	0.7188	0.5587	0.5912	0.5860	0.5901	0.5941	0.6000	0.6104	0.6244
73	0.7292	0.5613	0.5950	0.5896	0.5938	0.5979	0.6047	0.6161	0.6279
74	0.7396	0.5645	0.5992	0.5936	0.5981	0.6022	0.6100	0.6227	0.6320
75	0.7500	0.5695	0.6065	0.6002	0.6049	0.6089	0.6181	0.6327	0.6388
76	0.7604	0.5745	0.6139	0.6071	0.6118	0.6158	0.6266	0.6429	0.6457
77	0.7708	0.5794	0.6213	0.6140	0.6188	0.6227	0.6350	0.6531	0.6527
78	0.7812	0.5883	0.6329	0.6248	0.6292	0.6328	0.6475	0.6676	0.6638
79	0.7917	0.5978	0.6447	0.6359	0.6398	0.6430	0.6601	0.6822	0.6753
80	0.8021	0.6085	0.6571	0.6478	0.6506	0.6533	0.6729	0.6966	0.6874
81	0.8125	0.6193	0.6695	0.6597	0.6615	0.6636	0.6857	0.7110	0.6996
82	0.8229	0.6269	0.6785	0.6681	0.6689	0.6705	0.6943	0.7208	0.7084
83	0.8333	0.6338	0.6866	0.6758	0.6755	0.6765	0.7020	0.7294	0.7163
84	0.8437	0.6434	0.6956	0.6847	0.6835	0.6838	0.7114	0.7401	0.7255
85	0.8542	0.6468	0.6965	0.6860	0.6850	0.6850	0.7134	0.7428	0.7268
86	0.8646	0.6502	0.6973	0.6872	0.6864	0.6863	0.7154	0.7454	0.7281
87	0.8750	0.6540	0.6986	0.6889	0.6883	0.6879	0.7178	0.7485	0.7298
88	0.8854	0.6595	0.7015	0.6920	0.6915	0.6908	0.7219	0.7535	0.7330
89	0.8958	0.6642	0.7035	0.6945	0.6939	0.6930	0.7254	0.7574	0.7356
90	0.9062	0.6699	0.7070	0.6982	0.6974	0.6962	0.7300	0.7628	0.7395
91	0.9167	0.6740	0.7082	0.6999	0.6990	0.6976	0.7327	0.7659	0.7412
92	0.9271	0.6774	0.7077	0.7004	0.6996	0.6984	0.7352	0.7686	0.7417
93	0.9375	0.6805	0.7061	0.6999	0.6996	0.6987	0.7371	0.7707	0.7410
94	0.9479	0.6840	0.7034	0.6987	0.6992	0.6988	0.7392	0.7731	0.7395
95	0.9583	0.6875	0.7007	0.6975	0.6988	0.6989	0.7413	0.7754	0.7381
96	0.9687	0.6909	0.6982	0.6964	0.6985	0.6990	0.7433	0.7776	0.7368
97	0.9792	0.6928	0.6964	0.6956	0.6983	0.6992	0.7447	0.7791	0.7357
98	0.9896	0.6938	0.6952	0.6953	0.6982	0.6997	0.7462	0.7803	0.7350
99	1.0000	0.6949	0.6939	0.6949	0.6981	0.7001	0.7476	0.7816	0.7344
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		0.78159	0.38483	0.39676					
		Upleg velocity (m/s). Normalised conductivities							
Point no.	y/D	4.7	3.5	2.9	2.4	2.1	1.7	1.4	3.6
1									
2		0.6350	0.8705	0.8495	0.8107	0.8722	0.8600	0.8673	0.7244
3	0.0000	0.6388	0.8744	0.8542	0.8155	0.8793	0.8682	0.8765	0.7288
4	0.0104	0.6439	0.8797	0.8613	0.8237	0.8897	0.8810	0.8905	0.7345
5	0.0208	0.6492	0.8847	0.8683	0.8320	0.9001	0.8939	0.9045	0.7400
6	0.0313	0.6557	0.8896	0.8742	0.8381	0.9079	0.9035	0.9150	0.7454
7	0.0417	0.6626	0.8943	0.8798	0.8435	0.9149	0.9119	0.9243	0.7507
8	0.0521	0.6695	0.8991	0.8854	0.8489	0.9219	0.9203	0.9336	0.7559
9	0.0625	0.6764	0.9039	0.8910	0.8543	0.9289	0.9288	0.9429	0.7612
10	0.0729	0.6831	0.9062	0.8929	0.8547	0.9293	0.9290	0.9433	0.7640
11	0.0833	0.6896	0.9060	0.8908	0.8496	0.9223	0.9202	0.9338	0.7639
12	0.0938	0.6961	0.9057	0.8886	0.8445	0.9153	0.9114	0.9243	0.7639
13	0.1042	0.7034	0.9067	0.8891	0.8431	0.9121	0.9076	0.9202	0.7652
14	0.1146	0.7108	0.9086	0.8929	0.8475	0.9138	0.9115	0.9242	0.7674
15	0.1250	0.7127	0.9064	0.8910	0.8455	0.9091	0.9073	0.9197	0.7654
16	0.1354	0.7132	0.9030	0.8865	0.8395	0.9007	0.8974	0.9090	0.7620
17	0.1458	0.7135	0.8996	0.8818	0.8335	0.8922	0.8875	0.8982	0.7586
18	0.1563	0.7126	0.8951	0.8761	0.8266	0.8828	0.8767	0.8866	0.7541
19	0.1667	0.7110	0.8898	0.8695	0.8187	0.8723	0.8648	0.8737	0.7489
20	0.1771	0.7103	0.8853	0.8639	0.8120	0.8631	0.8542	0.8623	0.7446
21	0.1875	0.7120	0.8839	0.8619	0.8090	0.8585	0.8488	0.8566	0.7432
22	0.1979	0.7149	0.8853	0.8629	0.8094	0.8588	0.8489	0.8569	0.7446
23	0.2083	0.7202	0.8892	0.8686	0.8162	0.8658	0.8578	0.8667	0.7487
24	0.2188	0.7249	0.8930	0.8751	0.8249	0.8743	0.8687	0.8786	0.7526
25	0.2292	0.7279	0.8945	0.8777	0.8285	0.8776	0.8733	0.8839	0.7543
26	0.2396	0.7362	0.8983	0.8845	0.8381	0.8876	0.8872	0.8998	0.7592
27	0.2500	0.7463	0.9030	0.8926	0.8496	0.8998	0.9041	0.9192	0.7653
28	0.2604	0.7611	0.9172	0.9146	0.8779	0.9301	0.9423	0.9611	0.7800
29	0.2708	0.7730	0.9306	0.9349	0.9036	0.9582	0.9769	0.9990	0.7934
30	0.2813	0.7692	0.9213	0.9287	0.9019	0.9547	0.9773	1.0000	0.7859
31	0.2917	0.7666	0.9093	0.9169	0.8929	0.9447	0.9695	0.9931	0.7768
32	0.3021	0.7594	0.8892	0.8945	0.8715	0.9205	0.9451	0.9687	0.7600
33	0.3125	0.7521	0.8690	0.8719	0.8498	0.8960	0.9205	0.9440	0.7430
34	0.3229	0.7448	0.8490	0.8495	0.8283	0.8718	0.8960	0.9195	0.7262
35	0.3333	0.7374	0.8313	0.8295	0.8089	0.8495	0.8731	0.8962	0.7110
36	0.3438	0.7256	0.8060	0.8018	0.7825	0.8194	0.8426	0.8650	0.6893
37	0.3542	0.7116	0.7819	0.7769	0.7601	0.7937	0.8168	0.8378	0.6685
38	0.3646	0.6976	0.7569	0.7498	0.7344	0.7643	0.7864	0.8060	0.6468
39	0.3750	0.6835	0.7312	0.7208	0.7059	0.7317	0.7521	0.7699	0.6243
40	0.3854	0.6765	0.7175	0.7064	0.6928	0.7166	0.7370	0.7544	0.6124
41	0.3958	0.6753	0.7137	0.7040	0.6924	0.7158	0.7377	0.7555	0.6094
42	0.4063	0.6723	0.7079	0.6981	0.6872	0.7098	0.7317	0.7493	0.6044
43	0.4167	0.6693	0.7021	0.6922	0.6821	0.7037	0.7257	0.7431	0.5995
44	0.4271	0.6712	0.7052	0.6969	0.6880	0.7096	0.7331	0.7511	0.6021
45	0.4375	0.6719	0.7057	0.6995	0.6926	0.7138	0.7390	0.7575	0.6025
46	0.4479	0.6709	0.7024	0.6983	0.6934	0.7140	0.7404	0.7591	0.5997
47	0.4583	0.6735	0.7064	0.7048	0.7018	0.7222	0.7506	0.7700	0.6031
48	0.4688	0.6719	0.7025	0.7028	0.7014	0.7208	0.7499	0.7691	0.5996
49	0.4792	0.6663	0.6914	0.6927	0.6925	0.7099	0.7383	0.7561	0.5898
50	0.4896	0.6664	0.6892	0.6919	0.6927	0.7092	0.7378	0.7553	0.5877
51	0.5000	0.6667	0.6871	0.6913	0.6931	0.7087	0.7376	0.7549	0.5859

52	0.5104	0.6632	0.6786	0.6831	0.6850	0.6991	0.7268	0.7427	0.5783
53	0.5208	0.6608	0.6726	0.6778	0.6797	0.6927	0.7193	0.7341	0.5729
54	0.5313	0.6576	0.6652	0.6708	0.6727	0.6846	0.7100	0.7236	0.5662
55	0.5417	0.6535	0.6559	0.6619	0.6638	0.6744	0.6982	0.7107	0.5579
56	0.5521	0.6494	0.6467	0.6529	0.6549	0.6643	0.6865	0.6978	0.5497
57	0.5625	0.6426	0.6314	0.6377	0.6391	0.6462	0.6654	0.6740	0.5360
58	0.5729	0.6358	0.6165	0.6230	0.6236	0.6285	0.6445	0.6503	0.5225
59	0.5833	0.6302	0.6048	0.6115	0.6113	0.6144	0.6279	0.6313	0.5118
60	0.5938	0.6235	0.5906	0.5979	0.5970	0.5982	0.6088	0.6095	0.4989
61	0.6042	0.6155	0.5731	0.5817	0.5801	0.5792	0.5863	0.5843	0.4830
62	0.6146	0.6135	0.5685	0.5774	0.5748	0.5727	0.5784	0.5738	0.4785
63	0.6250	0.6121	0.5658	0.5750	0.5713	0.5686	0.5731	0.5665	0.4757
64	0.6354	0.6058	0.5536	0.5634	0.5595	0.5556	0.5577	0.5494	0.4647
65	0.6458	0.5996	0.5415	0.5518	0.5476	0.5426	0.5424	0.5323	0.4537
66	0.6563	0.5928	0.5284	0.5397	0.5350	0.5290	0.5261	0.5136	0.4417
67	0.6667	0.5835	0.5101	0.5227	0.5177	0.5103	0.5037	0.4885	0.4249
68	0.6771	0.5800	0.5049	0.5176	0.5119	0.5040	0.4960	0.4790	0.4201
69	0.6875	0.5766	0.4998	0.5126	0.5060	0.4977	0.4883	0.4694	0.4153
70	0.6979	0.5731	0.4945	0.5076	0.5005	0.4918	0.4810	0.4604	0.4103
71	0.7083	0.5674	0.4872	0.5003	0.4916	0.4822	0.4694	0.4460	0.4033
72	0.7188	0.5617	0.4798	0.4929	0.4827	0.4725	0.4576	0.4314	0.3963
73	0.7292	0.5553	0.4703	0.4840	0.4734	0.4630	0.4460	0.4172	0.3873
74	0.7396	0.5473	0.4596	0.4739	0.4626	0.4521	0.4325	0.4004	0.3771
75	0.7500	0.5347	0.4414	0.4571	0.4454	0.4353	0.4120	0.3754	0.3600
76	0.7604	0.5221	0.4227	0.4398	0.4279	0.4179	0.3907	0.3496	0.3425
77	0.7708	0.5095	0.4039	0.4225	0.4103	0.4005	0.3695	0.3239	0.3249
78	0.7812	0.4873	0.3748	0.3952	0.3842	0.3751	0.3381	0.2874	0.2969
79	0.7917	0.4633	0.3450	0.3671	0.3575	0.3493	0.3061	0.2506	0.2680
80	0.8021	0.4362	0.3137	0.3372	0.3301	0.3233	0.2739	0.2143	0.2373
81	0.8125	0.4091	0.2825	0.3072	0.3028	0.2974	0.2418	0.1779	0.2066
82	0.8229	0.3898	0.2599	0.2859	0.2840	0.2801	0.2199	0.1533	0.1845
83	0.8333	0.3724	0.2395	0.2668	0.2674	0.2649	0.2005	0.1315	0.1646
84	0.8437	0.3483	0.2168	0.2441	0.2472	0.2465	0.1770	0.1046	0.1414
85	0.8542	0.3397	0.2146	0.2409	0.2435	0.2433	0.1719	0.0979	0.1381
86	0.8646	0.3312	0.2125	0.2378	0.2399	0.2402	0.1669	0.0913	0.1349
87	0.8750	0.3216	0.2091	0.2337	0.2352	0.2361	0.1607	0.0833	0.1306
88	0.8854	0.3078	0.2020	0.2259	0.2270	0.2288	0.1504	0.0709	0.1224
89	0.8958	0.2959	0.1969	0.2195	0.2211	0.2234	0.1417	0.0609	0.1160
90	0.9062	0.2815	0.1880	0.2102	0.2121	0.2152	0.1302	0.0475	0.1062
91	0.9167	0.2712	0.1851	0.2060	0.2082	0.2116	0.1232	0.0396	0.1018
92	0.9271	0.2625	0.1861	0.2046	0.2066	0.2097	0.1170	0.0328	0.1006
93	0.9375	0.2547	0.1903	0.2059	0.2067	0.2089	0.1121	0.0274	0.1024
94	0.9479	0.2460	0.1971	0.2089	0.2077	0.2087	0.1068	0.0215	0.1060
95	0.9583	0.2372	0.2039	0.2119	0.2087	0.2085	0.1015	0.0157	0.1097
96	0.9687	0.2285	0.2102	0.2147	0.2094	0.2081	0.0966	0.0101	0.1130
97	0.9792	0.2238	0.2147	0.2167	0.2100	0.2076	0.0929	0.0063	0.1156
98	0.9896	0.2212	0.2178	0.2176	0.2102	0.2065	0.0893	0.0032	0.1173
99	1.0000	0.2185	0.2209	0.2185	0.2104	0.2055	0.0858	0.0000	0.1190
100									
101									

d56_k10ss3sc10

-1		1.1379	0.17688	0.96102								
		Upleg velocity (m/s)										
Point no.	y/D	4.9	4.2	3.8	3.3	3.0	2.6	2.4	2.3	2.0	1.5	1.0
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.9405	0.9361	0.9467	0.9005	0.8685	0.8691	0.8926	0.8619	0.7304	0.2424	0.2088
3	0.0000	0.9396	0.9346	0.9456	0.8987	0.8653	0.8667	0.8903	0.8594	0.7268	0.2323	0.1996
4	0.0104	0.9381	0.9322	0.9437	0.8960	0.8608	0.8622	0.8856	0.8539	0.7191	0.2184	0.1880
5	0.0208	0.9366	0.9298	0.9416	0.8931	0.8559	0.8579	0.8811	0.8486	0.7122	0.2058	0.1789
6	0.0313	0.9347	0.9276	0.9397	0.8906	0.8522	0.8557	0.8787	0.8461	0.7104	0.1998	0.1769
7	0.0417	0.9328	0.9254	0.9377	0.8883	0.8489	0.8542	0.8770	0.8445	0.7103	0.1959	0.1772
8	0.0521	0.9309	0.9232	0.9358	0.8859	0.8456	0.8526	0.8753	0.8429	0.7102	0.1920	0.1775
9	0.0625	0.9290	0.9211	0.9339	0.8835	0.8423	0.8511	0.8736	0.8414	0.7100	0.1881	0.1779
10	0.0729	0.9272	0.9198	0.9325	0.8824	0.8419	0.8536	0.8759	0.8449	0.7191	0.1991	0.1941
11	0.0833	0.9253	0.9196	0.9317	0.8828	0.8447	0.8607	0.8825	0.8540	0.7382	0.2264	0.2279
12	0.0938	0.9234	0.9193	0.9309	0.8831	0.8475	0.8677	0.8891	0.8631	0.7573	0.2537	0.2617
13	0.1042	0.9210	0.9181	0.9294	0.8824	0.8491	0.8721	0.8929	0.8685	0.7706	0.2752	0.2895
14	0.1146	0.9177	0.9155	0.9268	0.8804	0.8494	0.8719	0.8915	0.8669	0.7732	0.2888	0.3095
15	0.1250	0.9165	0.9150	0.9265	0.8807	0.8524	0.8739	0.8928	0.8684	0.7777	0.3040	0.3270
16	0.1354	0.9161	0.9158	0.9269	0.8822	0.8564	0.8789	0.8975	0.8743	0.7890	0.3246	0.3494
17	0.1458	0.9157	0.9166	0.9273	0.8837	0.8604	0.8840	0.9022	0.8803	0.8005	0.3455	0.3721
18	0.1563	0.9157	0.9176	0.9281	0.8857	0.8649	0.8891	0.9069	0.8862	0.8114	0.3663	0.3940
19	0.1667	0.9158	0.9190	0.9292	0.8880	0.8698	0.8946	0.9121	0.8926	0.8228	0.3884	0.4169
20	0.1771	0.9157	0.9200	0.9299	0.8900	0.8742	0.8997	0.9169	0.8985	0.8338	0.4097	0.4393
21	0.1875	0.9148	0.9200	0.9296	0.8905	0.8768	0.9030	0.9199	0.9024	0.8424	0.4248	0.4561
22	0.1979	0.9138	0.9194	0.9290	0.8900	0.8770	0.9039	0.9208	0.9038	0.8460	0.4290	0.4614
23	0.2083	0.9115	0.9170	0.9269	0.8877	0.8752	0.9010	0.9175	0.8999	0.8426	0.4266	0.4609
24	0.2188	0.9089	0.9145	0.9242	0.8853	0.8737	0.8973	0.9129	0.8942	0.8372	0.4257	0.4610
25	0.2292	0.9073	0.9131	0.9228	0.8843	0.8736	0.8960	0.9112	0.8920	0.8361	0.4285	0.4643
26	0.2396	0.9030	0.9090	0.9193	0.8812	0.8721	0.8918	0.9062	0.8859	0.8316	0.4289	0.4668
27	0.2500	0.8979	0.9040	0.9150	0.8775	0.8700	0.8866	0.9001	0.8785	0.8261	0.4286	0.4690
28	0.2604	0.8907	0.8958	0.9072	0.8692	0.8618	0.8725	0.8844	0.8591	0.8041	0.4078	0.4506
29	0.2708	0.8848	0.8888	0.9003	0.8616	0.8532	0.8592	0.8699	0.8414	0.7827	0.3833	0.4276
30	0.2813	0.8835	0.8876	0.8996	0.8630	0.8565	0.8577	0.8672	0.8374	0.7789	0.3949	0.4377
31	0.2917	0.8824	0.8871	0.8999	0.8659	0.8615	0.8605	0.8698	0.8400	0.7850	0.4134	0.4553
32	0.3021	0.8828	0.8890	0.9027	0.8724	0.8718	0.8701	0.8794	0.8513	0.8035	0.4498	0.4902
33	0.3125	0.8833	0.8910	0.9055	0.8789	0.8821	0.8797	0.8891	0.8627	0.8223	0.4865	0.5254
34	0.3229	0.8838	0.8930	0.9083	0.8855	0.8924	0.8893	0.8988	0.8741	0.8409	0.5229	0.5602
35	0.3333	0.8847	0.8952	0.9112	0.8915	0.9018	0.8981	0.9076	0.8844	0.8574	0.5560	0.5918
36	0.3438	0.8864	0.8984	0.9150	0.8998	0.9139	0.9088	0.9183	0.8967	0.8765	0.5966	0.6294
37	0.3542	0.8890	0.9018	0.9188	0.9074	0.9237	0.9159	0.9253	0.9043	0.8869	0.6267	0.6557
38	0.3646	0.8919	0.9059	0.9233	0.9160	0.9351	0.9256	0.9350	0.9153	0.9022	0.6625	0.6880
39	0.3750	0.8950	0.9105	0.9285	0.9253	0.9478	0.9375	0.9471	0.9292	0.9220	0.7035	0.7255
40	0.3854	0.8961	0.9121	0.9304	0.9298	0.9539	0.9421	0.9518	0.9344	0.9297	0.7224	0.7422
41	0.3958	0.8955	0.9114	0.9296	0.9303	0.9544	0.9409	0.9505	0.9326	0.9276	0.7231	0.7416
42	0.4063	0.8961	0.9120	0.9304	0.9324	0.9571	0.9426	0.9523	0.9344	0.9300	0.7304	0.7474
43	0.4167	0.8966	0.9127	0.9312	0.9344	0.9597	0.9442	0.9541	0.9362	0.9324	0.7376	0.7532
44	0.4271	0.8956	0.9112	0.9295	0.9335	0.9584	0.9412	0.9511	0.9324	0.9273	0.7311	0.7456
45	0.4375	0.8947	0.9097	0.9279	0.9331	0.9576	0.9379	0.9479	0.9281	0.9215	0.7254	0.7380
46	0.4479	0.8943	0.9089	0.9269	0.9337	0.9579	0.9358	0.9460	0.9253	0.9174	0.7234	0.7341
47	0.4583	0.8930	0.9069	0.9246	0.9326	0.9561	0.9312	0.9416	0.9195	0.9093	0.7137	0.7224
48	0.4688	0.8931	0.9065	0.9241	0.9337	0.9570	0.9300	0.9405	0.9177	0.9063	0.7134	0.7201
49	0.4792	0.8949	0.9081	0.9257	0.9371	0.9604	0.9322	0.9430	0.9202	0.9084	0.7226	0.7271
50	0.4896	0.8950	0.9078	0.9254	0.9379	0.9610	0.9316	0.9427	0.9194	0.9068	0.7228	0.7258

51	0.5000	0.8951	0.9075	0.9250	0.9387	0.9616	0.9309	0.9423	0.9186	0.9051	0.7228	0.7244
52	0.5104	0.8967	0.9090	0.9266	0.9415	0.9645	0.9339	0.9457	0.9223	0.9092	0.7320	0.7325
53	0.5208	0.8978	0.9100	0.9276	0.9433	0.9662	0.9357	0.9477	0.9245	0.9115	0.7375	0.7372
54	0.5313	0.8993	0.9113	0.9290	0.9454	0.9683	0.9380	0.9502	0.9274	0.9146	0.7444	0.7435
55	0.5417	0.9010	0.9131	0.9309	0.9479	0.9708	0.9410	0.9533	0.9310	0.9186	0.7531	0.7517
56	0.5521	0.9028	0.9149	0.9327	0.9503	0.9733	0.9440	0.9565	0.9346	0.9227	0.7618	0.7600
57	0.5625	0.9059	0.9181	0.9361	0.9550	0.9781	0.9501	0.9629	0.9422	0.9314	0.7788	0.7761
58	0.5729	0.9092	0.9213	0.9395	0.9595	0.9828	0.9561	0.9693	0.9496	0.9398	0.7953	0.7917
59	0.5833	0.9118	0.9239	0.9422	0.9632	0.9865	0.9609	0.9744	0.9556	0.9464	0.8081	0.8039
60	0.5938	0.9149	0.9269	0.9452	0.9672	0.9904	0.9660	0.9797	0.9618	0.9533	0.8219	0.8170
61	0.6042	0.9184	0.9303	0.9487	0.9717	0.9947	0.9715	0.9855	0.9686	0.9606	0.8369	0.8313
62	0.6146	0.9200	0.9316	0.9500	0.9740	0.9968	0.9745	0.9888	0.9725	0.9646	0.8444	0.8381
63	0.6250	0.9212	0.9326	0.9510	0.9757	0.9983	0.9768	0.9914	0.9755	0.9676	0.8500	0.8432
64	0.6354	0.9237	0.9351	0.9534	0.9785	1.0010	0.9805	0.9950	0.9798	0.9724	0.8598	0.8529
65	0.6458	0.9261	0.9375	0.9559	0.9814	1.0038	0.9841	0.9986	0.9841	0.9772	0.8697	0.8627
66	0.6563	0.9289	0.9402	0.9586	0.9846	1.0068	0.9883	1.0027	0.9890	0.9824	0.8804	0.8734
67	0.6667	0.9326	0.9437	0.9621	0.9888	1.0107	0.9935	1.0079	0.9953	0.9891	0.8945	0.8874
68	0.6771	0.9342	0.9452	0.9635	0.9906	1.0123	0.9960	1.0104	0.9983	0.9924	0.9009	0.8936
69	0.6875	0.9357	0.9467	0.9649	0.9924	1.0140	0.9985	1.0130	1.0013	0.9956	0.9072	0.8998
70	0.6979	0.9372	0.9481	0.9663	0.9940	1.0155	1.0008	1.0152	1.0040	0.9984	0.9129	0.9054
71	0.7083	0.9395	0.9503	0.9684	0.9966	1.0179	1.0045	1.0189	1.0085	1.0032	0.9226	0.9149
72	0.7188	0.9418	0.9526	0.9706	0.9993	1.0203	1.0083	1.0227	1.0131	1.0081	0.9323	0.9243
73	0.7292	0.9442	0.9548	0.9727	1.0018	1.0224	1.0116	1.0258	1.0169	1.0120	0.9405	0.9326
74	0.7396	0.9471	0.9575	0.9752	1.0047	1.0249	1.0154	1.0295	1.0213	1.0165	0.9502	0.9424
75	0.7500	0.9516	0.9615	0.9790	1.0090	1.0284	1.0208	1.0343	1.0272	1.0224	0.9647	0.9575
76	0.7604	0.9561	0.9656	0.9830	1.0135	1.0322	1.0264	1.0394	1.0335	1.0287	0.9794	0.9726
77	0.7708	0.9606	0.9697	0.9869	1.0179	1.0359	1.0320	1.0446	1.0397	1.0349	0.9940	0.9877
78	0.7812	0.9669	0.9755	0.9922	1.0235	1.0403	1.0383	1.0500	1.0465	1.0414	1.0099	1.0044
79	0.7917	0.9733	0.9813	0.9976	1.0290	1.0444	1.0442	1.0549	1.0527	1.0474	1.0246	1.0200
80	0.8021	0.9796	0.9871	1.0028	1.0340	1.0480	1.0493	1.0589	1.0579	1.0523	1.0363	1.0329
81	0.8125	0.9859	0.9930	1.0080	1.0391	1.0516	1.0544	1.0630	1.0631	1.0571	1.0480	1.0457
82	0.8229	0.9904	0.9970	1.0117	1.0426	1.0541	1.0577	1.0653	1.0663	1.0599	1.0562	1.0549
83	0.8333	0.9944	1.0006	1.0151	1.0458	1.0563	1.0605	1.0672	1.0689	1.0621	1.0635	1.0632
84	0.8437	0.9994	1.0051	1.0190	1.0495	1.0586	1.0639	1.0695	1.0721	1.0649	1.0715	1.0722
85	0.8542	1.0008	1.0064	1.0202	1.0505	1.0592	1.0650	1.0702	1.0733	1.0659	1.0745	1.0754
86	0.8646	1.0022	1.0077	1.0213	1.0514	1.0598	1.0662	1.0709	1.0744	1.0670	1.0776	1.0785
87	0.8750	1.0038	1.0093	1.0226	1.0526	1.0605	1.0674	1.0717	1.0757	1.0681	1.0811	1.0823
88	0.8854	1.0062	1.0115	1.0245	1.0542	1.0615	1.0691	1.0728	1.0773	1.0696	1.0859	1.0874
89	0.8958	1.0081	1.0132	1.0261	1.0556	1.0624	1.0706	1.0736	1.0789	1.0712	1.0897	1.0913
90	0.9062	1.0105	1.0155	1.0281	1.0574	1.0635	1.0722	1.0746	1.0804	1.0725	1.0945	1.0967
91	0.9167	1.0120	1.0169	1.0294	1.0586	1.0643	1.0734	1.0752	1.0818	1.0739	1.0981	1.1003
92	0.9271	1.0133	1.0181	1.0306	1.0596	1.0653	1.0750	1.0761	1.0836	1.0759	1.1029	1.1048
93	0.9375	1.0140	1.0190	1.0314	1.0604	1.0662	1.0765	1.0770	1.0856	1.0782	1.1081	1.1094
94	0.9479	1.0147	1.0198	1.0322	1.0612	1.0672	1.0784	1.0782	1.0880	1.0812	1.1145	1.1149
95	0.9583	1.0153	1.0206	1.0330	1.0620	1.0681	1.0803	1.0793	1.0905	1.0841	1.1209	1.1205
96	0.9687	1.0159	1.0214	1.0337	1.0627	1.0690	1.0820	1.0804	1.0928	1.0869	1.1268	1.1256
97	0.9792	1.0160	1.0218	1.0341	1.0631	1.0697	1.0833	1.0813	1.0944	1.0890	1.1311	1.1292
98	0.9896	1.0160	1.0220	1.0342	1.0633	1.0702	1.0844	1.0821	1.0959	1.0909	1.1345	1.1319
99	1.0000	1.0159	1.0221	1.0344	1.0636	1.0708	1.0855	1.0829	1.0973	1.0928	1.1379	1.1346
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		1.1379	0.17688	0.96102								
		Upleg velocity (m/s). Normalised										
Point no.	y/D	4.9	4.2	3.8	3.3	3.0	2.6	2.4	2.3	2.0	1.5	1.0
1												
2		0.2054	0.2100	0.1990	0.2471	0.2804	0.2797	0.2553	0.2872	0.4241	0.9318	0.9667
3	0.0000	0.2063	0.2116	0.2001	0.2489	0.2837	0.2823	0.2576	0.2898	0.4277	0.9424	0.9764
4	0.0104	0.2079	0.2140	0.2021	0.2518	0.2884	0.2869	0.2625	0.2956	0.4358	0.9568	0.9884
5	0.0208	0.2095	0.2165	0.2042	0.2547	0.2934	0.2913	0.2672	0.3011	0.4430	0.9699	0.9980
6	0.0313	0.2114	0.2188	0.2063	0.2573	0.2973	0.2936	0.2697	0.3036	0.4448	0.9762	1.0000
7	0.0417	0.2134	0.2211	0.2083	0.2598	0.3007	0.2952	0.2715	0.3053	0.4449	0.9802	0.9997
8	0.0521	0.2154	0.2234	0.2103	0.2622	0.3042	0.2968	0.2732	0.3069	0.4451	0.9843	0.9993
9	0.0625	0.2174	0.2256	0.2123	0.2647	0.3076	0.2985	0.2750	0.3086	0.4452	0.9883	0.9990
10	0.0729	0.2193	0.2269	0.2137	0.2658	0.3080	0.2958	0.2726	0.3049	0.4358	0.9769	0.9821
11	0.0833	0.2212	0.2272	0.2146	0.2655	0.3051	0.2885	0.2658	0.2954	0.4159	0.9485	0.9469
12	0.0938	0.2232	0.2275	0.2154	0.2652	0.3022	0.2811	0.2589	0.2859	0.3960	0.9200	0.9118
13	0.1042	0.2257	0.2287	0.2169	0.2659	0.3005	0.2766	0.2549	0.2803	0.3822	0.8977	0.8828
14	0.1146	0.2291	0.2314	0.2196	0.2680	0.3002	0.2768	0.2564	0.2820	0.3795	0.8836	0.8620
15	0.1250	0.2304	0.2319	0.2200	0.2676	0.2971	0.2747	0.2551	0.2805	0.3749	0.8677	0.8438
16	0.1354	0.2308	0.2311	0.2196	0.2660	0.2929	0.2695	0.2502	0.2743	0.3630	0.8462	0.8204
17	0.1458	0.2312	0.2303	0.2191	0.2645	0.2888	0.2642	0.2453	0.2681	0.3511	0.8246	0.7968
18	0.1563	0.2312	0.2292	0.2183	0.2624	0.2841	0.2589	0.2403	0.2619	0.3398	0.8029	0.7741
19	0.1667	0.2311	0.2278	0.2172	0.2600	0.2790	0.2532	0.2349	0.2553	0.3279	0.7799	0.7503
20	0.1771	0.2312	0.2268	0.2165	0.2580	0.2744	0.2478	0.2300	0.2492	0.3164	0.7578	0.7269
21	0.1875	0.2322	0.2267	0.2167	0.2574	0.2717	0.2444	0.2269	0.2450	0.3075	0.7420	0.7095
22	0.1979	0.2332	0.2274	0.2174	0.2580	0.2714	0.2435	0.2259	0.2436	0.3037	0.7376	0.7039
23	0.2083	0.2356	0.2298	0.2196	0.2603	0.2733	0.2465	0.2293	0.2477	0.3073	0.7401	0.7044
24	0.2188	0.2383	0.2325	0.2223	0.2628	0.2749	0.2504	0.2341	0.2536	0.3129	0.7410	0.7044
25	0.2292	0.2400	0.2340	0.2238	0.2639	0.2750	0.2517	0.2359	0.2559	0.3141	0.7382	0.7009
26	0.2396	0.2444	0.2382	0.2275	0.2671	0.2766	0.2561	0.2411	0.2622	0.3187	0.7377	0.6984
27	0.2500	0.2497	0.2434	0.2319	0.2710	0.2787	0.2615	0.2474	0.2700	0.3245	0.7381	0.6961
28	0.2604	0.2573	0.2519	0.2401	0.2796	0.2873	0.2762	0.2638	0.2901	0.3474	0.7597	0.7152
29	0.2708	0.2634	0.2592	0.2473	0.2875	0.2962	0.2900	0.2789	0.3085	0.3696	0.7853	0.7391
30	0.2813	0.2647	0.2605	0.2480	0.2860	0.2928	0.2915	0.2816	0.3127	0.3736	0.7731	0.7286
31	0.2917	0.2659	0.2610	0.2476	0.2831	0.2876	0.2886	0.2790	0.3100	0.3673	0.7539	0.7103
32	0.3021	0.2654	0.2590	0.2448	0.2763	0.2769	0.2787	0.2690	0.2982	0.3480	0.7160	0.6740
33	0.3125	0.2649	0.2569	0.2418	0.2695	0.2662	0.2687	0.2589	0.2864	0.3284	0.6778	0.6374
34	0.3229	0.2644	0.2548	0.2389	0.2627	0.2555	0.2587	0.2488	0.2746	0.3091	0.6399	0.6011
35	0.3333	0.2635	0.2525	0.2359	0.2564	0.2457	0.2495	0.2397	0.2638	0.2919	0.6055	0.5683
36	0.3438	0.2618	0.2492	0.2320	0.2477	0.2331	0.2384	0.2285	0.2510	0.2720	0.5632	0.5291
37	0.3542	0.2590	0.2457	0.2280	0.2398	0.2229	0.2310	0.2212	0.2431	0.2612	0.5320	0.5018
38	0.3646	0.2560	0.2415	0.2233	0.2310	0.2111	0.2209	0.2111	0.2316	0.2452	0.4947	0.4682
39	0.3750	0.2527	0.2366	0.2179	0.2212	0.1978	0.2085	0.1986	0.2172	0.2247	0.4520	0.4291
40	0.3854	0.2516	0.2349	0.2160	0.2166	0.1915	0.2037	0.1937	0.2117	0.2166	0.4324	0.4118
41	0.3958	0.2522	0.2357	0.2167	0.2160	0.1909	0.2050	0.1950	0.2136	0.2188	0.4316	0.4124
42	0.4063	0.2516	0.2350	0.2159	0.2139	0.1882	0.2032	0.1931	0.2118	0.2163	0.4241	0.4063
43	0.4167	0.2511	0.2343	0.2151	0.2117	0.1854	0.2015	0.1913	0.2099	0.2138	0.4165	0.4003
44	0.4271	0.2522	0.2359	0.2169	0.2127	0.1868	0.2047	0.1944	0.2139	0.2191	0.4233	0.4082
45	0.4375	0.2531	0.2374	0.2186	0.2131	0.1876	0.2081	0.1977	0.2183	0.2252	0.4293	0.4161
46	0.4479	0.2535	0.2383	0.2195	0.2125	0.1873	0.2103	0.1997	0.2212	0.2295	0.4313	0.4202
47	0.4583	0.2549	0.2404	0.2220	0.2137	0.1891	0.2151	0.2043	0.2273	0.2379	0.4415	0.4324
48	0.4688	0.2547	0.2408	0.2225	0.2125	0.1883	0.2164	0.2054	0.2291	0.2410	0.4417	0.4348
49	0.4792	0.2529	0.2391	0.2208	0.2089	0.1847	0.2141	0.2028	0.2266	0.2388	0.4322	0.4275
50	0.4896	0.2528	0.2394	0.2212	0.2081	0.1840	0.2147	0.2031	0.2274	0.2404	0.4319	0.4288
51	0.5000	0.2527	0.2398	0.2216	0.2073	0.1835	0.2154	0.2035	0.2282	0.2422	0.4319	0.4303

52	0.5104	0.2510	0.2382	0.2199	0.2044	0.1805	0.2123	0.2000	0.2244	0.2380	0.4223	0.4219
53	0.5208	0.2498	0.2372	0.2188	0.2025	0.1786	0.2104	0.1979	0.2221	0.2356	0.4166	0.4170
54	0.5313	0.2483	0.2357	0.2173	0.2003	0.1765	0.2080	0.1953	0.2191	0.2324	0.4095	0.4104
55	0.5417	0.2465	0.2339	0.2154	0.1977	0.1739	0.2049	0.1920	0.2153	0.2282	0.4004	0.4019
56	0.5521	0.2447	0.2321	0.2135	0.1952	0.1712	0.2018	0.1888	0.2116	0.2239	0.3914	0.3933
57	0.5625	0.2414	0.2288	0.2100	0.1904	0.1663	0.1954	0.1821	0.2037	0.2149	0.3737	0.3765
58	0.5729	0.2380	0.2254	0.2065	0.1856	0.1614	0.1892	0.1754	0.1959	0.2061	0.3565	0.3602
59	0.5833	0.2353	0.2227	0.2036	0.1818	0.1576	0.1842	0.1702	0.1897	0.1993	0.3431	0.3476
60	0.5938	0.2321	0.2196	0.2005	0.1776	0.1535	0.1789	0.1646	0.1832	0.1921	0.3288	0.3339
61	0.6042	0.2284	0.2160	0.1969	0.1729	0.1490	0.1731	0.1586	0.1762	0.1845	0.3133	0.3190
62	0.6146	0.2267	0.2147	0.1955	0.1705	0.1468	0.1700	0.1551	0.1722	0.1804	0.3054	0.3120
63	0.6250	0.2255	0.2136	0.1945	0.1688	0.1453	0.1676	0.1525	0.1690	0.1772	0.2996	0.3067
64	0.6354	0.2229	0.2111	0.1919	0.1658	0.1425	0.1638	0.1487	0.1645	0.1722	0.2894	0.2965
65	0.6458	0.2204	0.2085	0.1894	0.1629	0.1395	0.1600	0.1449	0.1600	0.1672	0.2791	0.2864
66	0.6563	0.2174	0.2057	0.1866	0.1595	0.1364	0.1557	0.1407	0.1549	0.1618	0.2679	0.2753
67	0.6667	0.2136	0.2020	0.1829	0.1552	0.1324	0.1503	0.1353	0.1484	0.1548	0.2533	0.2607
68	0.6771	0.2120	0.2005	0.1815	0.1533	0.1307	0.1476	0.1327	0.1453	0.1515	0.2466	0.2542
69	0.6875	0.2104	0.1990	0.1800	0.1514	0.1289	0.1450	0.1300	0.1421	0.1481	0.2400	0.2477
70	0.6979	0.2089	0.1975	0.1786	0.1497	0.1274	0.1427	0.1277	0.1393	0.1452	0.2341	0.2419
71	0.7083	0.2064	0.1952	0.1764	0.1470	0.1249	0.1388	0.1238	0.1346	0.1402	0.2241	0.2321
72	0.7188	0.2040	0.1928	0.1741	0.1443	0.1224	0.1349	0.1199	0.1299	0.1351	0.2140	0.2222
73	0.7292	0.2015	0.1905	0.1719	0.1416	0.1202	0.1314	0.1166	0.1259	0.1310	0.2054	0.2136
74	0.7396	0.1985	0.1877	0.1693	0.1386	0.1176	0.1275	0.1128	0.1213	0.1263	0.1953	0.2034
75	0.7500	0.1939	0.1836	0.1653	0.1341	0.1139	0.1218	0.1078	0.1152	0.1202	0.1802	0.1878
76	0.7604	0.1892	0.1793	0.1612	0.1294	0.1100	0.1160	0.1025	0.1086	0.1136	0.1649	0.1720
77	0.7708	0.1845	0.1751	0.1571	0.1249	0.1061	0.1102	0.0971	0.1022	0.1072	0.1497	0.1563
78	0.7812	0.1779	0.1690	0.1516	0.1190	0.1016	0.1036	0.0915	0.0951	0.1004	0.1332	0.1389
79	0.7917	0.1713	0.1629	0.1460	0.1133	0.0973	0.0975	0.0864	0.0887	0.0942	0.1179	0.1227
80	0.8021	0.1648	0.1569	0.1406	0.1081	0.0935	0.0922	0.0822	0.0832	0.0891	0.1057	0.1093
81	0.8125	0.1582	0.1508	0.1352	0.1028	0.0898	0.0869	0.0779	0.0778	0.0841	0.0935	0.0959
82	0.8229	0.1535	0.1466	0.1313	0.0992	0.0872	0.0835	0.0755	0.0745	0.0812	0.0850	0.0864
83	0.8333	0.1493	0.1429	0.1278	0.0958	0.0849	0.0805	0.0736	0.0718	0.0789	0.0774	0.0777
84	0.8437	0.1442	0.1382	0.1237	0.0920	0.0825	0.0770	0.0712	0.0685	0.0760	0.0691	0.0684
85	0.8542	0.1427	0.1368	0.1225	0.0909	0.0819	0.0759	0.0704	0.0672	0.0749	0.0660	0.0650
86	0.8646	0.1412	0.1355	0.1213	0.0900	0.0813	0.0746	0.0697	0.0661	0.0738	0.0627	0.0618
87	0.8750	0.1395	0.1338	0.1200	0.0888	0.0805	0.0734	0.0689	0.0647	0.0726	0.0591	0.0579
88	0.8854	0.1370	0.1315	0.1180	0.0871	0.0795	0.0716	0.0677	0.0631	0.0711	0.0541	0.0525
89	0.8958	0.1351	0.1298	0.1163	0.0856	0.0786	0.0700	0.0669	0.0614	0.0694	0.0502	0.0485
90	0.9062	0.1326	0.1274	0.1143	0.0838	0.0774	0.0684	0.0659	0.0598	0.0681	0.0452	0.0429
91	0.9167	0.1310	0.1259	0.1129	0.0825	0.0766	0.0671	0.0652	0.0584	0.0666	0.0414	0.0391
92	0.9271	0.1297	0.1247	0.1117	0.0815	0.0755	0.0655	0.0643	0.0565	0.0645	0.0364	0.0344
93	0.9375	0.1289	0.1237	0.1108	0.0806	0.0746	0.0639	0.0634	0.0544	0.0621	0.0310	0.0297
94	0.9479	0.1282	0.1229	0.1100	0.0798	0.0736	0.0619	0.0621	0.0519	0.0590	0.0243	0.0239
95	0.9583	0.1276	0.1221	0.1092	0.0790	0.0726	0.0599	0.0610	0.0493	0.0560	0.0177	0.0181
96	0.9687	0.1269	0.1212	0.1084	0.0783	0.0717	0.0582	0.0598	0.0469	0.0531	0.0116	0.0128
97	0.9792	0.1268	0.1208	0.1080	0.0778	0.0710	0.0568	0.0589	0.0453	0.0509	0.0071	0.0091
98	0.9896	0.1268	0.1206	0.1079	0.0776	0.0704	0.0557	0.0581	0.0437	0.0489	0.0035	0.0062
99	1.0000	0.1269	0.1205	0.1077	0.0773	0.0698	0.0545	0.0572	0.0422	0.0469	0.0000	0.0034
100												
101												

d56_k10ss3sc20

-1		1.0906	0.55954	0.53106					
		Upleg velocity (m/s)							
Point no.	y/D	4.3	3.6	3.1	2.7	2.2	1.6	0.9	5.3
1		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2		0.7068	0.6754	0.6921	0.6646	0.6533	0.6151	0.6158	0.9019
3	0.0000	0.7044	0.6719	0.6878	0.6605	0.6492	0.6097	0.6091	0.8979
4	0.0104	0.7008	0.6669	0.6815	0.6548	0.6438	0.6008	0.5990	0.8932
5	0.0208	0.6979	0.6619	0.6749	0.6492	0.6383	0.5924	0.5886	0.8886
6	0.0313	0.6951	0.6578	0.6693	0.6452	0.6342	0.5877	0.5808	0.8825
7	0.0417	0.6923	0.6540	0.6640	0.6417	0.6305	0.5842	0.5738	0.8759
8	0.0521	0.6895	0.6502	0.6587	0.6383	0.6267	0.5807	0.5669	0.8694
9	0.0625	0.6868	0.6464	0.6534	0.6348	0.6230	0.5772	0.5599	0.8628
10	0.0729	0.6860	0.6457	0.6513	0.6357	0.6229	0.5820	0.5595	0.8559
11	0.0833	0.6872	0.6484	0.6526	0.6414	0.6268	0.5959	0.5664	0.8484
12	0.0938	0.6885	0.6511	0.6540	0.6471	0.6307	0.6098	0.5733	0.8409
13	0.1042	0.6875	0.6519	0.6538	0.6508	0.6331	0.6191	0.5772	0.8327
14	0.1146	0.6832	0.6502	0.6519	0.6522	0.6340	0.6210	0.5770	0.8244
15	0.1250	0.6822	0.6525	0.6546	0.6565	0.6380	0.6266	0.5825	0.8202
16	0.1354	0.6839	0.6565	0.6588	0.6626	0.6431	0.6375	0.5912	0.8180
17	0.1458	0.6856	0.6606	0.6630	0.6687	0.6482	0.6483	0.6000	0.8158
18	0.1563	0.6880	0.6654	0.6681	0.6753	0.6541	0.6594	0.6096	0.8141
19	0.1667	0.6909	0.6708	0.6739	0.6826	0.6606	0.6713	0.6201	0.8129
20	0.1771	0.6931	0.6755	0.6789	0.6893	0.6663	0.6826	0.6297	0.8109
21	0.1875	0.6929	0.6774	0.6811	0.6931	0.6692	0.6903	0.6353	0.8074
22	0.1979	0.6911	0.6766	0.6806	0.6933	0.6690	0.6923	0.6359	0.8044
23	0.2083	0.6860	0.6727	0.6771	0.6908	0.6660	0.6889	0.6315	0.7981
24	0.2188	0.6809	0.6686	0.6735	0.6882	0.6630	0.6853	0.6272	0.7906
25	0.2292	0.6778	0.6671	0.6726	0.6880	0.6623	0.6852	0.6265	0.7852
26	0.2396	0.6688	0.6618	0.6691	0.6860	0.6593	0.6832	0.6225	0.7708
27	0.2500	0.6577	0.6552	0.6648	0.6836	0.6554	0.6805	0.6174	0.7534
28	0.2604	0.6409	0.6396	0.6509	0.6709	0.6422	0.6621	0.5976	0.7333
29	0.2708	0.6268	0.6244	0.6370	0.6573	0.6287	0.6426	0.5775	0.7183
30	0.2813	0.6264	0.6276	0.6426	0.6631	0.6344	0.6477	0.5837	0.7078
31	0.2917	0.6267	0.6327	0.6514	0.6725	0.6428	0.6612	0.5957	0.6968
32	0.3021	0.6320	0.6442	0.6676	0.6895	0.6585	0.6877	0.6200	0.6882
33	0.3125	0.6374	0.6559	0.6839	0.7066	0.6744	0.7145	0.6444	0.6796
34	0.3229	0.6429	0.6675	0.7000	0.7236	0.6902	0.7410	0.6686	0.6713
35	0.3333	0.6486	0.6788	0.7147	0.7390	0.7045	0.7643	0.6905	0.6654
36	0.3438	0.6576	0.6933	0.7342	0.7587	0.7235	0.7933	0.7187	0.6597
37	0.3542	0.6682	0.7069	0.7514	0.7753	0.7401	0.8142	0.7411	0.6584
38	0.3646	0.6797	0.7223	0.7705	0.7940	0.7587	0.8394	0.7671	0.6575
39	0.3750	0.6920	0.7394	0.7913	0.8147	0.7790	0.8685	0.7965	0.6570
40	0.3854	0.6976	0.7464	0.8012	0.8241	0.7887	0.8824	0.8106	0.6555
41	0.3958	0.6976	0.7453	0.8021	0.8244	0.7896	0.8838	0.8122	0.6534
42	0.4063	0.7003	0.7480	0.8064	0.8280	0.7937	0.8891	0.8183	0.6539
43	0.4167	0.7029	0.7508	0.8106	0.8316	0.7978	0.8945	0.8244	0.6543
44	0.4271	0.7012	0.7462	0.8073	0.8271	0.7946	0.8906	0.8211	0.6542
45	0.4375	0.7004	0.7417	0.8050	0.8231	0.7924	0.8873	0.8191	0.6548
46	0.4479	0.7009	0.7394	0.8049	0.8216	0.7926	0.8864	0.8198	0.6561
47	0.4583	0.6988	0.7328	0.8004	0.8149	0.7881	0.8798	0.8152	0.6574
48	0.4688	0.7001	0.7314	0.8012	0.8141	0.7895	0.8799	0.8173	0.6602
49	0.4792	0.7052	0.7354	0.8072	0.8188	0.7964	0.8859	0.8259	0.6654

50	0.4896	0.7055	0.7341	0.8078	0.8180	0.7976	0.8861	0.8278	0.6684
51	0.5000	0.7057	0.7326	0.8081	0.8169	0.7988	0.8861	0.8297	0.6713
52	0.5104	0.7090	0.7365	0.8134	0.8214	0.8050	0.8918	0.8374	0.6760
53	0.5208	0.7111	0.7386	0.8164	0.8237	0.8091	0.8951	0.8423	0.6800
54	0.5313	0.7139	0.7419	0.8203	0.8273	0.8138	0.8993	0.8478	0.6839
55	0.5417	0.7175	0.7464	0.8253	0.8323	0.8197	0.9047	0.8544	0.6878
56	0.5521	0.7210	0.7509	0.8303	0.8372	0.8255	0.9101	0.8610	0.6918
57	0.5625	0.7268	0.7592	0.8396	0.8461	0.8366	0.9204	0.8738	0.6995
58	0.5729	0.7326	0.7673	0.8485	0.8545	0.8475	0.9301	0.8863	0.7078
59	0.5833	0.7372	0.7737	0.8555	0.8610	0.8559	0.9374	0.8959	0.7150
60	0.5938	0.7425	0.7807	0.8630	0.8681	0.8652	0.9451	0.9062	0.7232
61	0.6042	0.7488	0.7886	0.8713	0.8762	0.8754	0.9535	0.9171	0.7326
62	0.6146	0.7502	0.7913	0.8748	0.8785	0.8806	0.9570	0.9231	0.7394
63	0.6250	0.7509	0.7932	0.8773	0.8801	0.8843	0.9594	0.9275	0.7446
64	0.6354	0.7557	0.7993	0.8830	0.8862	0.8910	0.9651	0.9341	0.7498
65	0.6458	0.7604	0.8053	0.8888	0.8923	0.8976	0.9707	0.9408	0.7551
66	0.6563	0.7650	0.8117	0.8950	0.8985	0.9051	0.9765	0.9479	0.7624
67	0.6667	0.7716	0.8203	0.9032	0.9072	0.9147	0.9844	0.9572	0.7707
68	0.6771	0.7738	0.8239	0.9067	0.9104	0.9189	0.9876	0.9615	0.7751
69	0.6875	0.7760	0.8275	0.9102	0.9137	0.9231	0.9909	0.9658	0.7795
70	0.6979	0.7782	0.8308	0.9134	0.9168	0.9269	0.9937	0.9695	0.7837
71	0.7083	0.7814	0.8363	0.9188	0.9218	0.9330	0.9986	0.9759	0.7902
72	0.7188	0.7847	0.8419	0.9241	0.9268	0.9392	1.0036	0.9824	0.7968
73	0.7292	0.7884	0.8474	0.9290	0.9317	0.9449	1.0076	0.9873	0.8033
74	0.7396	0.7928	0.8540	0.9348	0.9375	0.9515	1.0122	0.9930	0.8112
75	0.7500	0.8001	0.8654	0.9442	0.9478	0.9617	1.0201	1.0010	0.8214
76	0.7604	0.8075	0.8765	0.9535	0.9578	0.9721	1.0278	1.0092	0.8322
77	0.7708	0.8149	0.8876	0.9629	0.9679	0.9824	1.0356	1.0175	0.8430
78	0.7812	0.8272	0.9020	0.9736	0.9799	0.9943	1.0426	1.0251	0.8583
79	0.7917	0.8402	0.9161	0.9838	0.9914	1.0053	1.0488	1.0318	0.8739
80	0.8021	0.8540	0.9298	0.9926	1.0014	1.0147	1.0526	1.0363	0.8902
81	0.8125	0.8678	0.9435	1.0015	1.0115	1.0241	1.0565	1.0408	0.9064
82	0.8229	0.8782	0.9540	1.0080	1.0195	1.0311	1.0596	1.0435	0.9165
83	0.8333	0.8877	0.9637	1.0140	1.0270	1.0374	1.0625	1.0458	0.9251
84	0.8437	0.8994	0.9747	1.0205	1.0345	1.0440	1.0642	1.0480	0.9373
85	0.8542	0.9026	0.9782	1.0226	1.0366	1.0459	1.0648	1.0493	0.9409
86	0.8646	0.9058	0.9817	1.0246	1.0387	1.0479	1.0655	1.0507	0.9444
87	0.8750	0.9095	0.9860	1.0271	1.0413	1.0502	1.0666	1.0522	0.9486
88	0.8854	0.9149	0.9920	1.0308	1.0453	1.0537	1.0682	1.0543	0.9545
89	0.8958	0.9195	0.9960	1.0331	1.0477	1.0564	1.0685	1.0561	0.9588
90	0.9062	0.9254	1.0022	1.0369	1.0521	1.0604	1.0703	1.0582	0.9645
91	0.9167	0.9295	1.0054	1.0389	1.0543	1.0630	1.0708	1.0599	0.9671
92	0.9271	0.9329	1.0068	1.0404	1.0555	1.0656	1.0710	1.0625	0.9677
93	0.9375	0.9346	1.0072	1.0419	1.0563	1.0682	1.0719	1.0661	0.9676
94	0.9479	0.9358	1.0069	1.0434	1.0570	1.0714	1.0731	1.0711	0.9671
95	0.9583	0.9370	1.0067	1.0449	1.0576	1.0747	1.0743	1.0760	0.9665
96	0.9687	0.9380	1.0068	1.0465	1.0583	1.0778	1.0756	1.0808	0.9664
97	0.9792	0.9382	1.0057	1.0473	1.0585	1.0799	1.0767	1.0844	0.9655
98	0.9896	0.9376	1.0038	1.0477	1.0581	1.0815	1.0773	1.0875	0.9642
99	1.0000	0.9370	1.0019	1.0481	1.0578	1.0830	1.0779	1.0906	0.9630
100		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

-1		1.0906		0.55954	0.53106				
		Upleg velocity (m/s). Normalised conductivities							
Point no.	y/D	4.3	3.6	3.1	2.7	2.2	1.6	0.9	5.3
1									
2		0.7227	0.7819	0.7504	0.8022	0.8235	0.8954	0.8941	0.3553
3	0.0000	0.7273	0.7884	0.7585	0.8099	0.8313	0.9055	0.9068	0.3628
4	0.0104	0.7339	0.7978	0.7703	0.8207	0.8414	0.9222	0.9256	0.3717
5	0.0208	0.7395	0.8073	0.7828	0.8311	0.8516	0.9381	0.9454	0.3804
6	0.0313	0.7448	0.8150	0.7934	0.8387	0.8594	0.9469	0.9601	0.3919
7	0.0417	0.7500	0.8222	0.8033	0.8452	0.8665	0.9535	0.9731	0.4042
8	0.0521	0.7552	0.8293	0.8132	0.8518	0.8735	0.9601	0.9862	0.4165
9	0.0625	0.7605	0.8365	0.8232	0.8583	0.8805	0.9667	0.9993	0.4289
10	0.0729	0.7620	0.8378	0.8272	0.8567	0.8807	0.9577	1.0000	0.4419
11	0.0833	0.7596	0.8327	0.8247	0.8459	0.8733	0.9316	0.9870	0.4561
12	0.0938	0.7572	0.8277	0.8222	0.8352	0.8660	0.9055	0.9741	0.4702
13	0.1042	0.7590	0.8261	0.8226	0.8281	0.8615	0.8879	0.9668	0.4856
14	0.1146	0.7671	0.8293	0.8261	0.8256	0.8598	0.8843	0.9672	0.5013
15	0.1250	0.7691	0.8250	0.8210	0.8174	0.8523	0.8736	0.9568	0.5092
16	0.1354	0.7659	0.8174	0.8131	0.8060	0.8427	0.8533	0.9403	0.5134
17	0.1458	0.7626	0.8098	0.8052	0.7945	0.8330	0.8328	0.9238	0.5175
18	0.1563	0.7582	0.8008	0.7956	0.7820	0.8220	0.8119	0.9058	0.5206
19	0.1667	0.7527	0.7904	0.7847	0.7683	0.8098	0.7896	0.8860	0.5230
20	0.1771	0.7485	0.7816	0.7752	0.7557	0.7989	0.7684	0.8680	0.5268
21	0.1875	0.7488	0.7781	0.7711	0.7486	0.7935	0.7538	0.8574	0.5332
22	0.1979	0.7524	0.7796	0.7720	0.7481	0.7939	0.7500	0.8562	0.5390
23	0.2083	0.7619	0.7869	0.7787	0.7529	0.7996	0.7565	0.8645	0.5508
24	0.2188	0.7715	0.7946	0.7853	0.7578	0.8053	0.7633	0.8726	0.5649
25	0.2292	0.7772	0.7975	0.7872	0.7582	0.8065	0.7633	0.8739	0.5750
26	0.2396	0.7943	0.8075	0.7937	0.7618	0.8122	0.7672	0.8815	0.6022
27	0.2500	0.8151	0.8199	0.8018	0.7664	0.8194	0.7723	0.8911	0.6350
28	0.2604	0.8468	0.8492	0.8279	0.7902	0.8443	0.8069	0.9284	0.6728
29	0.2708	0.8733	0.8778	0.8542	0.8160	0.8697	0.8437	0.9663	0.7010
30	0.2813	0.8740	0.8719	0.8436	0.8049	0.8590	0.8340	0.9544	0.7208
31	0.2917	0.8735	0.8623	0.8270	0.7873	0.8433	0.8086	0.9318	0.7416
32	0.3021	0.8635	0.8406	0.7966	0.7553	0.8136	0.7587	0.8862	0.7578
33	0.3125	0.8534	0.8186	0.7659	0.7231	0.7837	0.7082	0.8402	0.7739
34	0.3229	0.8431	0.7967	0.7355	0.6911	0.7540	0.6584	0.7946	0.7895
35	0.3333	0.8323	0.7755	0.7079	0.6620	0.7270	0.6144	0.7535	0.8006
36	0.3438	0.8153	0.7481	0.6711	0.6249	0.6913	0.5598	0.7004	0.8114
37	0.3542	0.7954	0.7225	0.6387	0.5938	0.6599	0.5205	0.6582	0.8139
38	0.3646	0.7737	0.6935	0.6027	0.5585	0.6249	0.4731	0.6091	0.8156
39	0.3750	0.7506	0.6614	0.5636	0.5195	0.5867	0.4183	0.5538	0.8165
40	0.3854	0.7401	0.6481	0.5450	0.5018	0.5686	0.3921	0.5272	0.8192
41	0.3958	0.7400	0.6502	0.5432	0.5013	0.5669	0.3895	0.5242	0.8232
42	0.4063	0.7350	0.6450	0.5352	0.4946	0.5591	0.3794	0.5127	0.8224
43	0.4167	0.7301	0.6399	0.5272	0.4878	0.5513	0.3694	0.5013	0.8215
44	0.4271	0.7332	0.6486	0.5334	0.4962	0.5574	0.3766	0.5074	0.8218
45	0.4375	0.7348	0.6569	0.5379	0.5037	0.5616	0.3829	0.5112	0.8205
46	0.4479	0.7339	0.6614	0.5379	0.5066	0.5612	0.3846	0.5099	0.8182
47	0.4583	0.7379	0.6738	0.5465	0.5191	0.5695	0.3969	0.5187	0.8158
48	0.4688	0.7353	0.6764	0.5450	0.5207	0.5670	0.3968	0.5147	0.8105
49	0.4792	0.7258	0.6688	0.5336	0.5118	0.5540	0.3855	0.4985	0.8007
50	0.4896	0.7252	0.6713	0.5326	0.5134	0.5517	0.3852	0.4948	0.7950

51	0.5000	0.7248	0.6741	0.5319	0.5153	0.5496	0.3852	0.4914	0.7895
52	0.5104	0.7186	0.6668	0.5220	0.5070	0.5377	0.3743	0.4767	0.7808
53	0.5208	0.7146	0.6627	0.5164	0.5025	0.5301	0.3681	0.4676	0.7731
54	0.5313	0.7093	0.6566	0.5091	0.4958	0.5211	0.3602	0.4572	0.7659
55	0.5417	0.7027	0.6481	0.4996	0.4865	0.5101	0.3500	0.4448	0.7584
56	0.5521	0.6960	0.6396	0.4901	0.4771	0.4991	0.3398	0.4324	0.7510
57	0.5625	0.6850	0.6240	0.4727	0.4605	0.4783	0.3205	0.4082	0.7365
58	0.5729	0.6741	0.6088	0.4558	0.4445	0.4579	0.3022	0.3847	0.7209
59	0.5833	0.6655	0.5968	0.4427	0.4324	0.4419	0.2885	0.3665	0.7073
60	0.5938	0.6554	0.5835	0.4285	0.4190	0.4245	0.2739	0.3473	0.6918
61	0.6042	0.6436	0.5686	0.4129	0.4038	0.4052	0.2582	0.3266	0.6741
62	0.6146	0.6410	0.5636	0.4064	0.3994	0.3955	0.2516	0.3154	0.6614
63	0.6250	0.6396	0.5600	0.4017	0.3964	0.3884	0.2470	0.3072	0.6516
64	0.6354	0.6307	0.5486	0.3908	0.3849	0.3759	0.2364	0.2947	0.6417
65	0.6458	0.6218	0.5373	0.3800	0.3735	0.3634	0.2258	0.2822	0.6317
66	0.6563	0.6131	0.5253	0.3684	0.3618	0.3494	0.2149	0.2686	0.6181
67	0.6667	0.6006	0.5089	0.3529	0.3454	0.3312	0.2000	0.2511	0.6023
68	0.6771	0.5965	0.5022	0.3463	0.3393	0.3233	0.1939	0.2431	0.5940
69	0.6875	0.5924	0.4955	0.3397	0.3331	0.3155	0.1878	0.2350	0.5858
70	0.6979	0.5883	0.4892	0.3336	0.3273	0.3082	0.1825	0.2281	0.5779
71	0.7083	0.5822	0.4788	0.3236	0.3179	0.2967	0.1732	0.2160	0.5656
72	0.7188	0.5760	0.4684	0.3135	0.3085	0.2851	0.1638	0.2038	0.5532
73	0.7292	0.5690	0.4580	0.3043	0.2992	0.2744	0.1563	0.1946	0.5410
74	0.7396	0.5608	0.4456	0.2934	0.2883	0.2619	0.1476	0.1839	0.5261
75	0.7500	0.5471	0.4242	0.2757	0.2690	0.2427	0.1328	0.1687	0.5068
76	0.7604	0.5331	0.4032	0.2581	0.2500	0.2232	0.1183	0.1533	0.4865
77	0.7708	0.5192	0.3823	0.2405	0.2311	0.2037	0.1036	0.1376	0.4662
78	0.7812	0.4959	0.3552	0.2203	0.2084	0.1814	0.0904	0.1233	0.4374
79	0.7917	0.4716	0.3286	0.2012	0.1869	0.1606	0.0787	0.1107	0.4081
80	0.8021	0.4456	0.3028	0.1845	0.1680	0.1429	0.0716	0.1022	0.3775
81	0.8125	0.4195	0.2770	0.1678	0.1489	0.1252	0.0642	0.0938	0.3469
82	0.8229	0.4000	0.2573	0.1555	0.1339	0.1120	0.0584	0.0887	0.3279
83	0.8333	0.3822	0.2391	0.1442	0.1198	0.1002	0.0529	0.0844	0.3117
84	0.8437	0.3601	0.2183	0.1320	0.1056	0.0877	0.0497	0.0802	0.2887
85	0.8542	0.3540	0.2116	0.1280	0.1017	0.0842	0.0486	0.0778	0.2819
86	0.8646	0.3480	0.2050	0.1243	0.0977	0.0804	0.0473	0.0751	0.2753
87	0.8750	0.3411	0.1970	0.1196	0.0928	0.0761	0.0452	0.0723	0.2674
88	0.8854	0.3308	0.1857	0.1126	0.0853	0.0695	0.0422	0.0684	0.2563
89	0.8958	0.3221	0.1782	0.1083	0.0808	0.0644	0.0416	0.0650	0.2482
90	0.9062	0.3110	0.1665	0.1011	0.0725	0.0569	0.0382	0.0610	0.2375
91	0.9167	0.3033	0.1604	0.0974	0.0684	0.0520	0.0373	0.0578	0.2326
92	0.9271	0.2970	0.1578	0.0945	0.0661	0.0471	0.0369	0.0529	0.2315
93	0.9375	0.2937	0.1570	0.0917	0.0646	0.0422	0.0352	0.0461	0.2315
94	0.9479	0.2915	0.1576	0.0889	0.0633	0.0362	0.0330	0.0367	0.2326
95	0.9583	0.2892	0.1580	0.0861	0.0621	0.0299	0.0307	0.0275	0.2338
96	0.9687	0.2873	0.1578	0.0830	0.0608	0.0241	0.0282	0.0185	0.2339
97	0.9792	0.2871	0.1599	0.0815	0.0604	0.0201	0.0262	0.0117	0.2356
98	0.9896	0.2882	0.1634	0.0808	0.0612	0.0171	0.0250	0.0058	0.2380
99	1.0000	0.2893	0.1670	0.0800	0.0618	0.0143	0.0239	0.0000	0.2404
100									
101									

d56_k10ss3sc30

-1		1.3067	0.68502	0.62168			
		Upleg velocity (m/s)					
Point no.	y/D	4.9	4.2	3.1	2.1	1.5	2.7
1		NaN	NaN	NaN	NaN	NaN	NaN
2		0.9877	1.0249	0.9748	0.9779	0.9959	1.0037
3	0.0000	0.9842	1.0218	0.9715	0.9749	0.9881	1.0008
4	0.0104	0.9807	1.0175	0.9672	0.9697	0.9766	0.9966
5	0.0208	0.9765	1.0124	0.9622	0.9639	0.9644	0.9925
6	0.0313	0.9731	1.0058	0.9564	0.9586	0.9517	0.9887
7	0.0417	0.9699	0.9987	0.9503	0.9533	0.9388	0.9850
8	0.0521	0.9667	0.9916	0.9443	0.9481	0.9259	0.9812
9	0.0625	0.9635	0.9844	0.9382	0.9428	0.9129	0.9775
10	0.0729	0.9624	0.9763	0.9321	0.9392	0.9020	0.9756
11	0.0833	0.9635	0.9669	0.9260	0.9374	0.8930	0.9757
12	0.0938	0.9647	0.9575	0.9199	0.9356	0.8840	0.9758
13	0.1042	0.9666	0.9479	0.9137	0.9317	0.8719	0.9743
14	0.1146	0.9715	0.9391	0.9085	0.9245	0.8551	0.9710
15	0.1250	0.9771	0.9362	0.9080	0.9233	0.8475	0.9711
16	0.1354	0.9809	0.9341	0.9078	0.9246	0.8465	0.9731
17	0.1458	0.9847	0.9319	0.9075	0.9258	0.8456	0.9751
18	0.1563	0.9889	0.9310	0.9083	0.9280	0.8454	0.9777
19	0.1667	0.9934	0.9306	0.9096	0.9309	0.8459	0.9809
20	0.1771	0.9977	0.9294	0.9102	0.9328	0.8454	0.9835
21	0.1875	1.0005	0.9263	0.9087	0.9320	0.8422	0.9840
22	0.1979	1.0009	0.9233	0.9064	0.9300	0.8382	0.9829
23	0.2083	1.0017	0.9183	0.9024	0.9237	0.8275	0.9791
24	0.2188	1.0040	0.9133	0.8984	0.9168	0.8161	0.9752
25	0.2292	1.0061	0.9101	0.8961	0.9130	0.8085	0.9733
26	0.2396	1.0096	0.9025	0.8898	0.9018	0.7874	0.9679
27	0.2500	1.0135	0.8935	0.8822	0.8883	0.7618	0.9614
28	0.2604	1.0151	0.8800	0.8700	0.8668	0.7299	0.9482
29	0.2708	1.0146	0.8687	0.8595	0.8487	0.7057	0.9364
30	0.2813	1.0227	0.8713	0.8627	0.8462	0.6955	0.9386
31	0.2917	1.0288	0.8742	0.8653	0.8446	0.6878	0.9428
32	0.3021	1.0368	0.8802	0.8716	0.8492	0.6867	0.9524
33	0.3125	1.0449	0.8863	0.8780	0.8538	0.6858	0.9622
34	0.3229	1.0529	0.8923	0.8843	0.8585	0.6850	0.9718
35	0.3333	1.0603	0.8984	0.8908	0.8640	0.6855	0.9808
36	0.3438	1.0689	0.9087	0.9009	0.8720	0.6916	0.9934
37	0.3542	1.0761	0.9217	0.9130	0.8811	0.7032	1.0055
38	0.3646	1.0836	0.9346	0.9253	0.8917	0.7152	1.0187
39	0.3750	1.0913	0.9474	0.9377	0.9039	0.7274	1.0329
40	0.3854	1.0944	0.9538	0.9438	0.9083	0.7335	1.0398
41	0.3958	1.0936	0.9550	0.9446	0.9065	0.7347	1.0406
42	0.4063	1.0940	0.9582	0.9476	0.9085	0.7391	1.0437
43	0.4167	1.0944	0.9614	0.9506	0.9104	0.7435	1.0467
44	0.4271	1.0900	0.9598	0.9490	0.9072	0.7440	1.0446
45	0.4375	1.0851	0.9595	0.9488	0.9042	0.7475	1.0435
46	0.4479	1.0818	0.9612	0.9503	0.9028	0.7534	1.0442
47	0.4583	1.0749	0.9595	0.9488	0.8986	0.7565	1.0415
48	0.4688	1.0713	0.9619	0.9514	0.8989	0.7647	1.0429
49	0.4792	1.0704	0.9685	0.9581	0.9043	0.7786	1.0483

50	0.4896	1.0669	0.9698	0.9599	0.9048	0.7857	1.0493
51	0.5000	1.0634	0.9709	0.9616	0.9052	0.7926	1.0501
52	0.5104	1.0633	0.9755	0.9668	0.9104	0.8034	1.0546
53	0.5208	1.0624	0.9786	0.9706	0.9144	0.8121	1.0575
54	0.5313	1.0628	0.9824	0.9749	0.9189	0.8207	1.0610
55	0.5417	1.0644	0.9871	0.9799	0.9243	0.8296	1.0655
56	0.5521	1.0660	0.9918	0.9850	0.9297	0.8386	1.0699
57	0.5625	1.0681	0.9996	0.9941	0.9403	0.8556	1.0777
58	0.5729	1.0697	1.0074	1.0032	0.9511	0.8731	1.0854
59	0.5833	1.0706	1.0135	1.0106	0.9600	0.8877	1.0913
60	0.5938	1.0720	1.0206	1.0191	0.9701	0.9039	1.0981
61	0.6042	1.0738	1.0290	1.0288	0.9816	0.9225	1.1060
62	0.6146	1.0710	1.0315	1.0336	0.9882	0.9344	1.1089
63	0.6250	1.0686	1.0332	1.0372	0.9935	0.9434	1.1109
64	0.6354	1.0713	1.0391	1.0436	1.0011	0.9541	1.1163
65	0.6458	1.0741	1.0451	1.0500	1.0088	0.9647	1.1217
66	0.6563	1.0756	1.0513	1.0576	1.0183	0.9783	1.1275
67	0.6667	1.0790	1.0599	1.0673	1.0302	0.9946	1.1355
68	0.6771	1.0792	1.0629	1.0714	1.0356	1.0024	1.1384
69	0.6875	1.0794	1.0659	1.0755	1.0411	1.0102	1.1413
70	0.6979	1.0796	1.0688	1.0795	1.0463	1.0176	1.1442
71	0.7083	1.0803	1.0733	1.0856	1.0542	1.0290	1.1485
72	0.7188	1.0810	1.0778	1.0917	1.0621	1.0405	1.1528
73	0.7292	1.0817	1.0827	1.0980	1.0705	1.0514	1.1574
74	0.7396	1.0824	1.0884	1.1056	1.0805	1.0644	1.1628
75	0.7500	1.0848	1.0981	1.1174	1.0949	1.0821	1.1717
76	0.7604	1.0873	1.1078	1.1292	1.1097	1.1006	1.1808
77	0.7708	1.0897	1.1176	1.1411	1.1245	1.1191	1.1898
78	0.7812	1.0950	1.1318	1.1569	1.1443	1.1422	1.2019
79	0.7917	1.1010	1.1463	1.1725	1.1637	1.1647	1.2139
80	0.8021	1.1082	1.1609	1.1875	1.1819	1.1852	1.2254
81	0.8125	1.1154	1.1755	1.2025	1.2000	1.2057	1.2370
82	0.8229	1.1207	1.1864	1.2135	1.2129	1.2190	1.2458
83	0.8333	1.1256	1.1964	1.2235	1.2244	1.2306	1.2539
84	0.8437	1.1313	1.2078	1.2353	1.2383	1.2448	1.2627
85	0.8542	1.1325	1.2104	1.2390	1.2422	1.2489	1.2648
86	0.8646	1.1337	1.2131	1.2427	1.2461	1.2529	1.2669
87	0.8750	1.1354	1.2164	1.2471	1.2507	1.2576	1.2696
88	0.8854	1.1384	1.2216	1.2535	1.2575	1.2643	1.2737
89	0.8958	1.1407	1.2251	1.2584	1.2629	1.2692	1.2767
90	0.9062	1.1443	1.2309	1.2653	1.2701	1.2760	1.2815
91	0.9167	1.1462	1.2337	1.2697	1.2751	1.2797	1.2841
92	0.9271	1.1470	1.2345	1.2735	1.2801	1.2828	1.2856
93	0.9375	1.1473	1.2340	1.2768	1.2845	1.2854	1.2865
94	0.9479	1.1476	1.2325	1.2806	1.2895	1.2880	1.2871
95	0.9583	1.1479	1.2311	1.2844	1.2946	1.2906	1.2877
96	0.9687	1.1484	1.2299	1.2880	1.2992	1.2932	1.2884
97	0.9792	1.1484	1.2283	1.2901	1.3023	1.2947	1.2886
98	0.9896	1.1483	1.2264	1.2912	1.3045	1.2955	1.2884
99	1.0000	1.1482	1.2244	1.2924	1.3067	1.2963	1.2882
100		NaN	NaN	NaN	NaN	NaN	NaN
101		NaN	NaN	NaN	NaN	NaN	NaN

-1		1.3067	0.68502	0.62168			
		Upleg velocity (m/s). Normalised conductivities					
Point no.	y/D	4.9	4.2	3.1	2.1	1.5	2.7
1							
2		0.5132	0.4533	0.5339	0.5289	0.5000	0.4874
3	0.0000	0.5188	0.4583	0.5392	0.5338	0.5125	0.4921
4	0.0104	0.5244	0.4652	0.5462	0.5421	0.5310	0.4987
5	0.0208	0.5311	0.4734	0.5541	0.5513	0.5506	0.5054
6	0.0313	0.5366	0.4840	0.5634	0.5600	0.5710	0.5115
7	0.0417	0.5418	0.4954	0.5732	0.5684	0.5918	0.5175
8	0.0521	0.5469	0.5069	0.5830	0.5769	0.6126	0.5235
9	0.0625	0.5520	0.5184	0.5928	0.5853	0.6334	0.5295
10	0.0729	0.5539	0.5315	0.6025	0.5911	0.6510	0.5325
11	0.0833	0.5521	0.5467	0.6123	0.5941	0.6655	0.5324
12	0.0938	0.5502	0.5618	0.6222	0.5970	0.6799	0.5323
13	0.1042	0.5471	0.5771	0.6321	0.6033	0.6994	0.5346
14	0.1146	0.5391	0.5913	0.6406	0.6148	0.7264	0.5400
15	0.1250	0.5302	0.5960	0.6413	0.6167	0.7387	0.5398
16	0.1354	0.5241	0.5994	0.6417	0.6147	0.7403	0.5367
17	0.1458	0.5180	0.6029	0.6421	0.6127	0.7417	0.5335
18	0.1563	0.5112	0.6044	0.6409	0.6092	0.7420	0.5292
19	0.1667	0.5040	0.6050	0.6388	0.6046	0.7412	0.5240
20	0.1771	0.4970	0.6069	0.6379	0.6015	0.7421	0.5198
21	0.1875	0.4925	0.6118	0.6403	0.6027	0.7472	0.5190
22	0.1979	0.4919	0.6168	0.6439	0.6060	0.7535	0.5208
23	0.2083	0.4906	0.6247	0.6504	0.6160	0.7709	0.5269
24	0.2188	0.4869	0.6329	0.6568	0.6271	0.7891	0.5332
25	0.2292	0.4835	0.6380	0.6605	0.6333	0.8014	0.5363
26	0.2396	0.4779	0.6502	0.6706	0.6513	0.8353	0.5449
27	0.2500	0.4716	0.6647	0.6828	0.6731	0.8764	0.5555
28	0.2604	0.4691	0.6864	0.7024	0.7076	0.9278	0.5766
29	0.2708	0.4699	0.7046	0.7194	0.7367	0.9667	0.5956
30	0.2813	0.4568	0.7003	0.7142	0.7407	0.9832	0.5922
31	0.2917	0.4470	0.6958	0.7100	0.7432	0.9955	0.5853
32	0.3021	0.4341	0.6861	0.6999	0.7360	0.9972	0.5698
33	0.3125	0.4211	0.6763	0.6896	0.7285	0.9987	0.5542
34	0.3229	0.4082	0.6665	0.6794	0.7209	1.0000	0.5387
35	0.3333	0.3963	0.6568	0.6690	0.7120	0.9992	0.5243
36	0.3438	0.3825	0.6403	0.6527	0.6993	0.9894	0.5040
37	0.3542	0.3709	0.6193	0.6333	0.6847	0.9708	0.4845
38	0.3646	0.3589	0.5986	0.6136	0.6675	0.9515	0.4633
39	0.3750	0.3465	0.5780	0.5935	0.6480	0.9318	0.4404
40	0.3854	0.3415	0.5676	0.5838	0.6408	0.9220	0.4293
41	0.3958	0.3428	0.5657	0.5824	0.6437	0.9200	0.4280
42	0.4063	0.3421	0.5605	0.5776	0.6406	0.9130	0.4230
43	0.4167	0.3415	0.5554	0.5729	0.6374	0.9059	0.4182
44	0.4271	0.3486	0.5581	0.5753	0.6426	0.9052	0.4216
45	0.4375	0.3565	0.5584	0.5757	0.6474	0.8994	0.4234
46	0.4479	0.3618	0.5557	0.5733	0.6496	0.8900	0.4222
47	0.4583	0.3729	0.5585	0.5757	0.6564	0.8851	0.4266
48	0.4688	0.3787	0.5547	0.5716	0.6560	0.8718	0.4243
49	0.4792	0.3801	0.5441	0.5607	0.6472	0.8494	0.4156
50	0.4896	0.3857	0.5420	0.5578	0.6464	0.8380	0.4140

51	0.5000	0.3914	0.5401	0.5551	0.6458	0.8269	0.4128
52	0.5104	0.3915	0.5327	0.5467	0.6375	0.8095	0.4055
53	0.5208	0.3930	0.5278	0.5406	0.6311	0.7955	0.4008
54	0.5313	0.3923	0.5217	0.5337	0.6237	0.7818	0.3952
55	0.5417	0.3898	0.5141	0.5256	0.6151	0.7674	0.3880
56	0.5521	0.3872	0.5066	0.5175	0.6064	0.7530	0.3809
57	0.5625	0.3838	0.4940	0.5029	0.5894	0.7256	0.3684
58	0.5729	0.3812	0.4814	0.4882	0.5720	0.6974	0.3560
59	0.5833	0.3798	0.4716	0.4763	0.5576	0.6740	0.3465
60	0.5938	0.3775	0.4602	0.4626	0.5415	0.6479	0.3355
61	0.6042	0.3746	0.4467	0.4470	0.5230	0.6181	0.3228
62	0.6146	0.3791	0.4427	0.4393	0.5123	0.5988	0.3182
63	0.6250	0.3830	0.4399	0.4335	0.5039	0.5844	0.3150
64	0.6354	0.3787	0.4304	0.4232	0.4916	0.5672	0.3063
65	0.6458	0.3741	0.4208	0.4129	0.4792	0.5501	0.2976
66	0.6563	0.3717	0.4108	0.4007	0.4639	0.5283	0.2883
67	0.6667	0.3663	0.3970	0.3851	0.4448	0.5020	0.2754
68	0.6771	0.3659	0.3922	0.3785	0.4361	0.4895	0.2707
69	0.6875	0.3656	0.3873	0.3719	0.4272	0.4769	0.2661
70	0.6979	0.3653	0.3827	0.3655	0.4189	0.4650	0.2614
71	0.7083	0.3642	0.3754	0.3556	0.4062	0.4467	0.2545
72	0.7188	0.3630	0.3682	0.3458	0.3935	0.4282	0.2476
73	0.7292	0.3619	0.3603	0.3357	0.3799	0.4107	0.2402
74	0.7396	0.3608	0.3511	0.3235	0.3639	0.3898	0.2315
75	0.7500	0.3569	0.3355	0.3045	0.3407	0.3613	0.2172
76	0.7604	0.3529	0.3199	0.2855	0.3169	0.3315	0.2025
77	0.7708	0.3491	0.3042	0.2664	0.2931	0.3018	0.1880
78	0.7812	0.3405	0.2813	0.2410	0.2612	0.2646	0.1686
79	0.7917	0.3309	0.2580	0.2159	0.2300	0.2284	0.1493
80	0.8021	0.3193	0.2345	0.1917	0.2007	0.1954	0.1308
81	0.8125	0.3077	0.2110	0.1676	0.1716	0.1625	0.1121
82	0.8229	0.2992	0.1935	0.1499	0.1509	0.1411	0.0980
83	0.8333	0.2913	0.1774	0.1338	0.1324	0.1224	0.0849
84	0.8437	0.2821	0.1591	0.1149	0.1100	0.0996	0.0708
85	0.8542	0.2802	0.1549	0.1089	0.1038	0.0930	0.0674
86	0.8646	0.2783	0.1506	0.1029	0.0975	0.0865	0.0640
87	0.8750	0.2755	0.1453	0.0959	0.0901	0.0790	0.0597
88	0.8854	0.2707	0.1369	0.0856	0.0791	0.0682	0.0531
89	0.8958	0.2670	0.1313	0.0777	0.0705	0.0603	0.0483
90	0.9062	0.2612	0.1219	0.0666	0.0589	0.0494	0.0405
91	0.9167	0.2582	0.1174	0.0595	0.0508	0.0434	0.0364
92	0.9271	0.2569	0.1161	0.0534	0.0428	0.0384	0.0339
93	0.9375	0.2564	0.1169	0.0481	0.0357	0.0343	0.0325
94	0.9479	0.2559	0.1194	0.0420	0.0277	0.0301	0.0315
95	0.9583	0.2554	0.1216	0.0359	0.0195	0.0259	0.0306
96	0.9687	0.2546	0.1235	0.0301	0.0121	0.0217	0.0294
97	0.9792	0.2546	0.1261	0.0267	0.0071	0.0193	0.0291
98	0.9896	0.2548	0.1292	0.0249	0.0035	0.0180	0.0294
99	1.0000	0.2550	0.1324	0.0230	0.0000	0.0167	0.0298
100							
101							

d56_k15ss1sc10

-1		1.0665	0.82253	0.24397						
		Upleg velocity (m/s). Normalised conductivities								
Point no.	y/D	5.0	4.3	3.5	1.9	2.9	1.2	0.6	0.5	0.4
1										
2		0.8509	0.7556	0.6744	0.5004	0.5028	0.3598	0.2500	0.1431	0.0840
3	0.0000	0.8511	0.7574	0.6732	0.5016	0.5033	0.3593	0.2463	0.1414	0.0816
4	0.0104	0.8513	0.7603	0.6736	0.5073	0.5065	0.3627	0.2463	0.1422	0.0824
5	0.0208	0.8513	0.7634	0.6741	0.5132	0.5101	0.3656	0.2455	0.1422	0.0824
6	0.0313	0.8502	0.7642	0.6721	0.5152	0.5103	0.3641	0.2410	0.1381	0.0783
7	0.0417	0.8488	0.7643	0.6694	0.5160	0.5095	0.3612	0.2353	0.1328	0.0730
8	0.0521	0.8474	0.7644	0.6666	0.5167	0.5087	0.3583	0.2295	0.1275	0.0672
9	0.0625	0.8460	0.7645	0.6639	0.5175	0.5079	0.3554	0.2238	0.1221	0.0619
10	0.0729	0.8429	0.7614	0.6591	0.5135	0.5035	0.3475	0.2156	0.1127	0.0525
11	0.0833	0.8379	0.7548	0.6522	0.5045	0.4953	0.3341	0.2045	0.0988	0.0389
12	0.0938	0.8329	0.7482	0.6452	0.4954	0.4871	0.3207	0.1935	0.0848	0.0254
13	0.1042	0.8285	0.7431	0.6409	0.4915	0.4815	0.3128	0.1873	0.0762	0.0164
14	0.1146	0.8252	0.7406	0.6427	0.4987	0.4819	0.3170	0.1943	0.0795	0.0180
15	0.1250	0.8234	0.7382	0.6434	0.5007	0.4804	0.3186	0.1988	0.0820	0.0189
16	0.1354	0.8212	0.7345	0.6416	0.4967	0.4764	0.3140	0.1976	0.0787	0.0148
17	0.1458	0.8189	0.7307	0.6399	0.4928	0.4724	0.3095	0.1963	0.0754	0.0115
18	0.1563	0.8174	0.7277	0.6389	0.4894	0.4690	0.3061	0.1963	0.0738	0.0090
19	0.1667	0.8159	0.7248	0.6379	0.4858	0.4656	0.3025	0.1963	0.0721	0.0070
20	0.1771	0.8144	0.7220	0.6371	0.4828	0.4625	0.2995	0.1972	0.0709	0.0049
21	0.1875	0.8127	0.7194	0.6367	0.4814	0.4599	0.2972	0.1976	0.0697	0.0029
22	0.1979	0.8116	0.7178	0.6360	0.4801	0.4578	0.2951	0.1959	0.0680	0.0000
23	0.2083	0.8115	0.7194	0.6401	0.4887	0.4612	0.3023	0.2037	0.0754	0.0053
24	0.2188	0.8124	0.7232	0.6480	0.5035	0.4691	0.3165	0.2201	0.0910	0.0184
25	0.2292	0.8132	0.7254	0.6527	0.5116	0.4729	0.3242	0.2295	0.1000	0.0254
26	0.2396	0.8168	0.7321	0.6641	0.5313	0.4816	0.3426	0.2496	0.1193	0.0389
27	0.2500	0.8214	0.7402	0.6777	0.5548	0.4918	0.3645	0.2731	0.1422	0.0545
28	0.2604	0.8258	0.7528	0.6986	0.5955	0.5137	0.4030	0.3135	0.1828	0.0877
29	0.2708	0.8289	0.7626	0.7141	0.6281	0.5318	0.4336	0.3447	0.2152	0.1148
30	0.2813	0.8381	0.7751	0.7289	0.6523	0.5457	0.4607	0.3743	0.2451	0.1394
31	0.2917	0.8501	0.7864	0.7400	0.6674	0.5530	0.4783	0.3930	0.2636	0.1517
32	0.3021	0.8623	0.7944	0.7460	0.6715	0.5528	0.4857	0.4027	0.2722	0.1537
33	0.3125	0.8745	0.8025	0.7518	0.6754	0.5525	0.4928	0.4122	0.2806	0.1562
34	0.3229	0.8864	0.8103	0.7575	0.6790	0.5522	0.4997	0.4215	0.2890	0.1582
35	0.3333	0.8955	0.8162	0.7619	0.6808	0.5514	0.5045	0.4287	0.2952	0.1599
36	0.3438	0.9097	0.8254	0.7681	0.6853	0.5524	0.5144	0.4413	0.3071	0.1664
37	0.3542	0.9243	0.8363	0.7760	0.6950	0.5586	0.5306	0.4591	0.3244	0.1808
38	0.3646	0.9377	0.8452	0.7814	0.6989	0.5608	0.5406	0.4711	0.3356	0.1894
39	0.3750	0.9501	0.8522	0.7844	0.6976	0.5595	0.5452	0.4778	0.3414	0.1922
40	0.3854	0.9587	0.8581	0.7879	0.7019	0.5615	0.5529	0.4867	0.3500	0.1988
41	0.3958	0.9642	0.8629	0.7917	0.7103	0.5661	0.5628	0.4969	0.3607	0.2074
42	0.4063	0.9686	0.8655	0.7930	0.7125	0.5672	0.5669	0.5014	0.3652	0.2111
43	0.4167	0.9729	0.8682	0.7944	0.7146	0.5681	0.5709	0.5059	0.3697	0.2148
44	0.4271	0.9735	0.8692	0.7947	0.7187	0.5702	0.5753	0.5106	0.3757	0.2201
45	0.4375	0.9762	0.8715	0.7958	0.7253	0.5736	0.5831	0.5190	0.3852	0.2287
46	0.4479	0.9808	0.8745	0.7973	0.7326	0.5771	0.5924	0.5285	0.3955	0.2386
47	0.4583	0.9816	0.8755	0.7974	0.7385	0.5798	0.5992	0.5359	0.4046	0.2472
48	0.4688	0.9852	0.8771	0.7972	0.7434	0.5817	0.6061	0.5430	0.4125	0.2549

49	0.4792	0.9901	0.8782	0.7957	0.7454	0.5818	0.6113	0.5479	0.4174	0.2611
50	0.4896	0.9920	0.8778	0.7939	0.7475	0.5813	0.6145	0.5510	0.4211	0.2652
51	0.5000	0.9939	0.8774	0.7921	0.7496	0.5809	0.6177	0.5541	0.4248	0.2689
52	0.5104	0.9959	0.8757	0.7886	0.7475	0.5778	0.6174	0.5531	0.4235	0.2689
53	0.5208	0.9958	0.8733	0.7848	0.7452	0.5749	0.6161	0.5512	0.4219	0.2685
54	0.5313	0.9964	0.8715	0.7818	0.7433	0.5725	0.6152	0.5499	0.4205	0.2685
55	0.5417	0.9980	0.8701	0.7794	0.7417	0.5704	0.6148	0.5492	0.4192	0.2685
56	0.5521	0.9995	0.8688	0.7771	0.7401	0.5683	0.6145	0.5484	0.4179	0.2685
57	0.5625	1.0000	0.8641	0.7703	0.7337	0.5620	0.6103	0.5429	0.4117	0.2652
58	0.5729	0.9991	0.8585	0.7627	0.7264	0.5551	0.6050	0.5363	0.4046	0.2615
59	0.5833	0.9972	0.8531	0.7558	0.7196	0.5490	0.5998	0.5300	0.3981	0.2578
60	0.5938	0.9949	0.8472	0.7485	0.7127	0.5426	0.5945	0.5237	0.3915	0.2549
61	0.6042	0.9923	0.8406	0.7405	0.7056	0.5360	0.5891	0.5174	0.3849	0.2521
62	0.6146	0.9861	0.8327	0.7316	0.6969	0.5284	0.5811	0.5080	0.3764	0.2472
63	0.6250	0.9803	0.8262	0.7244	0.6896	0.5223	0.5743	0.5001	0.3692	0.2427
64	0.6354	0.9791	0.8232	0.7209	0.6862	0.5195	0.5719	0.4973	0.3660	0.2418
65	0.6458	0.9777	0.8202	0.7175	0.6828	0.5168	0.5695	0.4946	0.3628	0.2410
66	0.6563	0.9733	0.8144	0.7115	0.6769	0.5122	0.5645	0.4890	0.3571	0.2394
67	0.6667	0.9697	0.8088	0.7057	0.6712	0.5078	0.5600	0.4840	0.3516	0.2381
68	0.6771	0.9657	0.8046	0.7012	0.6663	0.5042	0.5558	0.4792	0.3468	0.2357
69	0.6875	0.9616	0.8003	0.6967	0.6615	0.5008	0.5515	0.4743	0.3420	0.2332
70	0.6979	0.9575	0.7963	0.6927	0.6571	0.4977	0.5476	0.4699	0.3377	0.2312
71	0.7083	0.9514	0.7898	0.6859	0.6497	0.4927	0.5411	0.4626	0.3301	0.2271
72	0.7188	0.9453	0.7832	0.6791	0.6422	0.4876	0.5346	0.4551	0.3225	0.2230
73	0.7292	0.9377	0.7772	0.6735	0.6359	0.4836	0.5288	0.4489	0.3164	0.2205
74	0.7396	0.9275	0.7694	0.6661	0.6278	0.4786	0.5210	0.4407	0.3084	0.2172
75	0.7500	0.9151	0.7607	0.6582	0.6197	0.4745	0.5134	0.4335	0.3001	0.2156
76	0.7604	0.9030	0.7518	0.6502	0.6112	0.4699	0.5054	0.4257	0.2915	0.2140
77	0.7708	0.8909	0.7429	0.6421	0.6027	0.4653	0.4974	0.4179	0.2828	0.2119
78	0.7812	0.8696	0.7307	0.6318	0.5907	0.4599	0.4845	0.4063	0.2709	0.2090
79	0.7917	0.8472	0.7184	0.6215	0.5783	0.4548	0.4710	0.3941	0.2586	0.2054
80	0.8021	0.8221	0.7062	0.6118	0.5652	0.4505	0.4561	0.3812	0.2455	0.2008
81	0.8125	0.7971	0.6939	0.6022	0.5522	0.4463	0.4411	0.3682	0.2320	0.1959
82	0.8229	0.7807	0.6871	0.5970	0.5454	0.4452	0.4323	0.3618	0.2246	0.1951
83	0.8333	0.7664	0.6816	0.5929	0.5400	0.4449	0.4251	0.3571	0.2181	0.1951
84	0.8437	0.7424	0.6711	0.5842	0.5280	0.4416	0.4108	0.3453	0.2054	0.1902
85	0.8542	0.7332	0.6661	0.5792	0.5215	0.4399	0.4036	0.3389	0.1976	0.1861
86	0.8646	0.7241	0.6610	0.5743	0.5151	0.4381	0.3964	0.3326	0.1898	0.1824
87	0.8750	0.7142	0.6555	0.5690	0.5083	0.4364	0.3888	0.3261	0.1820	0.1783
88	0.8854	0.7015	0.6486	0.5627	0.5001	0.4346	0.3795	0.3182	0.1722	0.1734
89	0.8958	0.6904	0.6427	0.5571	0.4921	0.4327	0.3704	0.3101	0.1623	0.1693
90	0.9062	0.6785	0.6365	0.5516	0.4848	0.4317	0.3619	0.3032	0.1537	0.1660
91	0.9167	0.6700	0.6317	0.5466	0.4777	0.4304	0.3536	0.2960	0.1447	0.1627
92	0.9271	0.6614	0.6260	0.5403	0.4688	0.4275	0.3440	0.2868	0.1344	0.1586
93	0.9375	0.6537	0.6193	0.5328	0.4586	0.4239	0.3337	0.2763	0.1230	0.1537
94	0.9479	0.6452	0.6109	0.5233	0.4456	0.4191	0.3210	0.2627	0.1086	0.1467
95	0.9583	0.6367	0.6024	0.5138	0.4326	0.4144	0.3084	0.2492	0.0939	0.1398
96	0.9687	0.6285	0.5942	0.5048	0.4202	0.4101	0.2963	0.2361	0.0799	0.1332
97	0.9792	0.6238	0.5888	0.4987	0.4119	0.4064	0.2886	0.2275	0.0717	0.1287
98	0.9896	0.6209	0.5847	0.4942	0.4055	0.4032	0.2831	0.2205	0.0660	0.1258
99	1.0000	0.6179	0.5806	0.4898	0.3991	0.3999	0.2777	0.2136	0.0603	0.1226
100										
101										

d56_k15ss1sc20

-1		1.1275	0.95539	0.17211					
		Upleg velocity (m/s). Normalised conductivities							
Point no.	y/D	5.2	4.3	3.4	2.7	1.7	1.0	0.7	0.5
1									
2		0.9938	0.7807	0.7603	0.7274	0.5357	0.5183	0.3451	0.3265
3	0.0000	0.9957	0.7828	0.7643	0.7315	0.5404	0.5223	0.3492	0.3300
4	0.0104	0.9981	0.7871	0.7700	0.7385	0.5485	0.5293	0.3562	0.3370
5	0.0208	1.0000	0.7914	0.7752	0.7441	0.5560	0.5351	0.3626	0.3422
6	0.0313	0.9989	0.7937	0.7756	0.7443	0.5578	0.5334	0.3631	0.3411
7	0.0417	0.9968	0.7954	0.7745	0.7426	0.5572	0.5299	0.3614	0.3382
8	0.0521	0.9947	0.7970	0.7733	0.7409	0.5566	0.5264	0.3602	0.3353
9	0.0625	0.9927	0.7988	0.7722	0.7391	0.5560	0.5229	0.3585	0.3323
10	0.0729	0.9852	0.7972	0.7628	0.7274	0.5456	0.5078	0.3480	0.3190
11	0.0833	0.9716	0.7921	0.7441	0.7042	0.5241	0.4799	0.3271	0.2928
12	0.0938	0.9582	0.7870	0.7257	0.6815	0.5026	0.4515	0.3062	0.2673
13	0.1042	0.9458	0.7839	0.7088	0.6624	0.4852	0.4282	0.2888	0.2464
14	0.1146	0.9349	0.7848	0.6961	0.6496	0.4753	0.4131	0.2795	0.2342
15	0.1250	0.9267	0.7829	0.6844	0.6374	0.4648	0.3997	0.2696	0.2231
16	0.1354	0.9180	0.7790	0.6717	0.6229	0.4509	0.3829	0.2568	0.2080
17	0.1458	0.9093	0.7751	0.6595	0.6083	0.4375	0.3666	0.2440	0.1929
18	0.1563	0.9011	0.7714	0.6473	0.5944	0.4247	0.3509	0.2324	0.1795
19	0.1667	0.8927	0.7673	0.6356	0.5799	0.4114	0.3353	0.2208	0.1650
20	0.1771	0.8841	0.7638	0.6234	0.5659	0.3986	0.3201	0.2097	0.1516
21	0.1875	0.8762	0.7617	0.6136	0.5549	0.3881	0.3074	0.2005	0.1406
22	0.1979	0.8720	0.7607	0.6089	0.5496	0.3829	0.3016	0.1952	0.1354
23	0.2083	0.8682	0.7646	0.6072	0.5502	0.3852	0.3021	0.1970	0.1377
24	0.2188	0.8640	0.7719	0.6089	0.5531	0.3922	0.3068	0.2045	0.1453
25	0.2292	0.8595	0.7754	0.6072	0.5520	0.3934	0.3068	0.2063	0.1470
26	0.2396	0.8481	0.7836	0.6031	0.5502	0.3974	0.3074	0.2109	0.1511
27	0.2500	0.8345	0.7934	0.5979	0.5485	0.4026	0.3085	0.2161	0.1563
28	0.2604	0.8283	0.8148	0.6095	0.5665	0.4288	0.3318	0.2423	0.1848
29	0.2708	0.8270	0.8336	0.6252	0.5868	0.4555	0.3562	0.2684	0.2138
30	0.2813	0.8174	0.8416	0.6246	0.5863	0.4654	0.3620	0.2806	0.2225
31	0.2917	0.8011	0.8441	0.6165	0.5764	0.4637	0.3567	0.2806	0.2196
32	0.3021	0.7782	0.8388	0.5979	0.5531	0.4480	0.3370	0.2684	0.2016
33	0.3125	0.7552	0.8332	0.5793	0.5293	0.4317	0.3172	0.2557	0.1830
34	0.3229	0.7327	0.8278	0.5607	0.5061	0.4154	0.2975	0.2434	0.1650
35	0.3333	0.7147	0.8223	0.5438	0.4846	0.4003	0.2795	0.2312	0.1482
36	0.3438	0.6926	0.8159	0.5270	0.4619	0.3858	0.2615	0.2214	0.1313
37	0.3542	0.6810	0.8130	0.5218	0.4515	0.3841	0.2574	0.2225	0.1267
38	0.3646	0.6664	0.8068	0.5107	0.4346	0.3748	0.2458	0.2167	0.1145
39	0.3750	0.6496	0.7976	0.4950	0.4119	0.3591	0.2272	0.2051	0.0953
40	0.3854	0.6397	0.7950	0.4904	0.4032	0.3550	0.2220	0.2039	0.0906
41	0.3958	0.6356	0.7974	0.4950	0.4061	0.3614	0.2283	0.2121	0.0970
42	0.4063	0.6316	0.7961	0.4945	0.4038	0.3602	0.2272	0.2127	0.0959
43	0.4167	0.6275	0.7947	0.4939	0.4015	0.3597	0.2266	0.2138	0.0947
44	0.4271	0.6269	0.7967	0.5003	0.4061	0.3649	0.2336	0.2214	0.1017
45	0.4375	0.6258	0.7987	0.5084	0.4125	0.3730	0.2423	0.2318	0.1110
46	0.4479	0.6229	0.7999	0.5159	0.4178	0.3800	0.2510	0.2411	0.1185
47	0.4583	0.6229	0.8023	0.5264	0.4259	0.3887	0.2615	0.2533	0.1296
48	0.4688	0.6205	0.8017	0.5328	0.4300	0.3939	0.2684	0.2609	0.1354
49	0.4792	0.6176	0.7975	0.5357	0.4305	0.3951	0.2708	0.2638	0.1354

50	0.4896	0.6153	0.7957	0.5398	0.4329	0.3968	0.2737	0.2673	0.1377
51	0.5000	0.6124	0.7940	0.5438	0.4358	0.3986	0.2771	0.2713	0.1400
52	0.5104	0.6089	0.7886	0.5427	0.4329	0.3951	0.2737	0.2684	0.1354
53	0.5208	0.6072	0.7843	0.5421	0.4317	0.3928	0.2719	0.2667	0.1325
54	0.5313	0.6054	0.7800	0.5409	0.4305	0.3904	0.2702	0.2638	0.1290
55	0.5417	0.6037	0.7757	0.5392	0.4288	0.3875	0.2673	0.2609	0.1249
56	0.5521	0.6014	0.7713	0.5374	0.4271	0.3846	0.2649	0.2580	0.1203
57	0.5625	0.5973	0.7620	0.5322	0.4212	0.3765	0.2568	0.2493	0.1104
58	0.5729	0.5938	0.7524	0.5270	0.4154	0.3684	0.2493	0.2405	0.0999
59	0.5833	0.5921	0.7443	0.5229	0.4108	0.3614	0.2423	0.2330	0.0918
60	0.5938	0.5897	0.7356	0.5189	0.4061	0.3544	0.2359	0.2254	0.0831
61	0.6042	0.5874	0.7257	0.5148	0.4026	0.3480	0.2301	0.2173	0.0750
62	0.6146	0.5857	0.7187	0.5113	0.3980	0.3399	0.2237	0.2103	0.0680
63	0.6250	0.5845	0.7135	0.5084	0.3939	0.3341	0.2179	0.2045	0.0628
64	0.6354	0.5845	0.7083	0.5061	0.3922	0.3312	0.2156	0.2005	0.0581
65	0.6458	0.5845	0.7036	0.5032	0.3904	0.3283	0.2127	0.1958	0.0540
66	0.6563	0.5839	0.6978	0.5003	0.3881	0.3236	0.2086	0.1900	0.0488
67	0.6667	0.5839	0.6908	0.4968	0.3864	0.3196	0.2045	0.1836	0.0430
68	0.6771	0.5845	0.6874	0.4945	0.3835	0.3155	0.2010	0.1790	0.0395
69	0.6875	0.5845	0.6833	0.4921	0.3812	0.3120	0.1975	0.1749	0.0354
70	0.6979	0.5851	0.6804	0.4898	0.3794	0.3085	0.1946	0.1708	0.0325
71	0.7083	0.5857	0.6746	0.4863	0.3753	0.3033	0.1888	0.1638	0.0273
72	0.7188	0.5868	0.6693	0.4828	0.3719	0.2981	0.1836	0.1575	0.0215
73	0.7292	0.5874	0.6653	0.4799	0.3690	0.2940	0.1801	0.1522	0.0186
74	0.7396	0.5886	0.6600	0.4764	0.3655	0.2893	0.1755	0.1453	0.0145
75	0.7500	0.5903	0.6548	0.4724	0.3620	0.2841	0.1702	0.1365	0.0105
76	0.7604	0.5915	0.6490	0.4683	0.3585	0.2795	0.1656	0.1284	0.0058
77	0.7708	0.5932	0.6432	0.4642	0.3550	0.2742	0.1604	0.1203	0.0017
78	0.7812	0.5973	0.6368	0.4608	0.3527	0.2708	0.1580	0.1116	0.0000
79	0.7917	0.6019	0.6304	0.4573	0.3515	0.2679	0.1563	0.1040	0.0000
80	0.8021	0.6072	0.6263	0.4555	0.3509	0.2673	0.1569	0.0976	0.0023
81	0.8125	0.6130	0.6217	0.4532	0.3504	0.2667	0.1569	0.0918	0.0046
82	0.8229	0.6153	0.6200	0.4520	0.3504	0.2673	0.1580	0.0883	0.0081
83	0.8333	0.6170	0.6188	0.4515	0.3504	0.2684	0.1598	0.0854	0.0110
84	0.8437	0.6205	0.6159	0.4491	0.3486	0.2679	0.1598	0.0796	0.0145
85	0.8542	0.6223	0.6153	0.4480	0.3457	0.2673	0.1580	0.0755	0.0151
86	0.8646	0.6234	0.6141	0.4468	0.3434	0.2667	0.1563	0.0715	0.0157
87	0.8750	0.6246	0.6136	0.4456	0.3405	0.2661	0.1546	0.0668	0.0163
88	0.8854	0.6269	0.6124	0.4445	0.3387	0.2667	0.1540	0.0622	0.0174
89	0.8958	0.6281	0.6118	0.4433	0.3364	0.2667	0.1534	0.0581	0.0203
90	0.9062	0.6298	0.6118	0.4433	0.3353	0.2684	0.1540	0.0540	0.0227
91	0.9167	0.6292	0.6124	0.4422	0.3329	0.2696	0.1540	0.0500	0.0250
92	0.9271	0.6281	0.6130	0.4404	0.3294	0.2690	0.1534	0.0447	0.0273
93	0.9375	0.6269	0.6136	0.4381	0.3254	0.2690	0.1522	0.0389	0.0291
94	0.9479	0.6252	0.6141	0.4352	0.3201	0.2684	0.1511	0.0308	0.0308
95	0.9583	0.6234	0.6153	0.4329	0.3155	0.2684	0.1499	0.0232	0.0325
96	0.9687	0.6223	0.6159	0.4305	0.3114	0.2684	0.1487	0.0157	0.0343
97	0.9792	0.6211	0.6165	0.4288	0.3085	0.2684	0.1482	0.0105	0.0349
98	0.9896	0.6200	0.6165	0.4271	0.3068	0.2679	0.1482	0.0076	0.0354
99	1.0000	0.6188	0.6170	0.4253	0.3050	0.2673	0.1482	0.0041	0.0360
100									
101									

d56_k15ss1sc30

-1		0.9391	0.52877	0.41033						
		Upleg Velocity (m/s). Normalised conductivities								
Point no.	y/D	4.7	4.2	3.8	3.2	2.5	2.0	1.1	0.8	0.5
1										
2		0.9764	0.5928	0.6890	0.5673	0.4771	0.4036	0.2882	0.2612	0.1429
3	0.0000	0.9777	0.5951	0.6910	0.5690	0.4794	0.4062	0.2897	0.2632	0.1450
4	0.0104	0.9801	0.5981	0.6939	0.5712	0.4828	0.4098	0.2919	0.2661	0.1482
5	0.0208	0.9823	0.6009	0.6968	0.5736	0.4859	0.4132	0.2942	0.2687	0.1515
6	0.0313	0.9841	0.6031	0.6987	0.5743	0.4874	0.4146	0.2945	0.2693	0.1530
7	0.0417	0.9857	0.6052	0.7002	0.5745	0.4883	0.4154	0.2943	0.2692	0.1541
8	0.0521	0.9874	0.6074	0.7018	0.5747	0.4893	0.4162	0.2940	0.2691	0.1552
9	0.0625	0.9891	0.6095	0.7034	0.5749	0.4902	0.4169	0.2937	0.2691	0.1562
10	0.0729	0.9894	0.6098	0.7027	0.5723	0.4877	0.4138	0.2904	0.2652	0.1542
11	0.0833	0.9881	0.6080	0.6996	0.5665	0.4813	0.4062	0.2836	0.2572	0.1488
12	0.0938	0.9868	0.6062	0.6964	0.5608	0.4749	0.3987	0.2768	0.2492	0.1433
13	0.1042	0.9866	0.6052	0.6941	0.5557	0.4698	0.3926	0.2709	0.2425	0.1393
14	0.1146	0.9882	0.6049	0.6930	0.5514	0.4667	0.3888	0.2665	0.2379	0.1377
15	0.1250	0.9880	0.6034	0.6907	0.5469	0.4629	0.3846	0.2619	0.2336	0.1352
16	0.1354	0.9864	0.6010	0.6876	0.5425	0.4580	0.3791	0.2572	0.2284	0.1313
17	0.1458	0.9847	0.5986	0.6845	0.5380	0.4530	0.3736	0.2525	0.2231	0.1273
18	0.1563	0.9827	0.5961	0.6812	0.5336	0.4482	0.3683	0.2479	0.2181	0.1236
19	0.1667	0.9806	0.5933	0.6778	0.5290	0.4430	0.3628	0.2433	0.2131	0.1198
20	0.1771	0.9786	0.5908	0.6745	0.5246	0.4380	0.3575	0.2388	0.2081	0.1161
21	0.1875	0.9777	0.5893	0.6724	0.5212	0.4344	0.3534	0.2353	0.2041	0.1134
22	0.1979	0.9776	0.5889	0.6717	0.5197	0.4331	0.3517	0.2335	0.2023	0.1122
23	0.2083	0.9794	0.5903	0.6726	0.5195	0.4337	0.3524	0.2337	0.2024	0.1136
24	0.2188	0.9815	0.5924	0.6742	0.5200	0.4350	0.3542	0.2355	0.2035	0.1164
25	0.2292	0.9822	0.5931	0.6744	0.5193	0.4348	0.3541	0.2355	0.2033	0.1174
26	0.2396	0.9842	0.5950	0.6750	0.5176	0.4347	0.3547	0.2354	0.2038	0.1204
27	0.2500	0.9865	0.5974	0.6758	0.5157	0.4347	0.3555	0.2353	0.2046	0.1240
28	0.2604	0.9935	0.6047	0.6823	0.5202	0.4419	0.3641	0.2429	0.2114	0.1342
29	0.2708	1.0000	0.6118	0.6893	0.5261	0.4498	0.3735	0.2513	0.2186	0.1440
30	0.2813	0.9996	0.6128	0.6887	0.5242	0.4487	0.3746	0.2524	0.2210	0.1481
31	0.2917	0.9965	0.6114	0.6853	0.5197	0.4442	0.3723	0.2501	0.2209	0.1491
32	0.3021	0.9897	0.6062	0.6777	0.5109	0.4343	0.3647	0.2430	0.2165	0.1457
33	0.3125	0.9828	0.6010	0.6700	0.5021	0.4243	0.3570	0.2358	0.2120	0.1422
34	0.3229	0.9760	0.5957	0.6624	0.4934	0.4144	0.3494	0.2287	0.2075	0.1387
35	0.3333	0.9700	0.5909	0.6556	0.4856	0.4055	0.3422	0.2221	0.2032	0.1352
36	0.3438	0.9623	0.5852	0.6476	0.4772	0.3953	0.3349	0.2157	0.1996	0.1319
37	0.3542	0.9568	0.5821	0.6428	0.4728	0.3894	0.3320	0.2139	0.2000	0.1316
38	0.3646	0.9501	0.5774	0.6363	0.4665	0.3814	0.3265	0.2096	0.1982	0.1291
39	0.3750	0.9422	0.5713	0.6283	0.4584	0.3713	0.3187	0.2030	0.1943	0.1247
40	0.3854	0.9383	0.5688	0.6249	0.4554	0.3669	0.3163	0.2014	0.1938	0.1240
41	0.3958	0.9378	0.5693	0.6253	0.4566	0.3673	0.3184	0.2037	0.1962	0.1262
42	0.4063	0.9362	0.5683	0.6241	0.4558	0.3657	0.3179	0.2035	0.1965	0.1261
43	0.4167	0.9347	0.5673	0.6228	0.4550	0.3641	0.3173	0.2034	0.1968	0.1260
44	0.4271	0.9354	0.5680	0.6244	0.4575	0.3655	0.3199	0.2062	0.1989	0.1280
45	0.4375	0.9360	0.5689	0.6261	0.4606	0.3672	0.3233	0.2101	0.2019	0.1307
46	0.4479	0.9359	0.5695	0.6273	0.4631	0.3684	0.3264	0.2136	0.2049	0.1329
47	0.4583	0.9373	0.5707	0.6297	0.4670	0.3708	0.3304	0.2180	0.2081	0.1357
48	0.4688	0.9370	0.5710	0.6306	0.4691	0.3716	0.3328	0.2210	0.2103	0.1371
49	0.4792	0.9352	0.5703	0.6301	0.4695	0.3709	0.3332	0.2224	0.2111	0.1366

50	0.4896	0.9352	0.5705	0.6307	0.4708	0.3714	0.3345	0.2242	0.2119	0.1368
51	0.5000	0.9351	0.5707	0.6314	0.4722	0.3720	0.3358	0.2260	0.2127	0.1371
52	0.5104	0.9337	0.5697	0.6304	0.4711	0.3707	0.3345	0.2254	0.2114	0.1350
53	0.5208	0.9328	0.5691	0.6299	0.4708	0.3700	0.3338	0.2252	0.2103	0.1334
54	0.5313	0.9317	0.5684	0.6292	0.4701	0.3693	0.3329	0.2247	0.2092	0.1317
55	0.5417	0.9303	0.5677	0.6282	0.4691	0.3683	0.3317	0.2239	0.2081	0.1299
56	0.5521	0.9289	0.5670	0.6272	0.4680	0.3674	0.3305	0.2231	0.2069	0.1280
57	0.5625	0.9265	0.5654	0.6251	0.4654	0.3650	0.3273	0.2207	0.2035	0.1236
58	0.5729	0.9243	0.5637	0.6231	0.4628	0.3628	0.3240	0.2183	0.1998	0.1189
59	0.5833	0.9226	0.5623	0.6215	0.4608	0.3610	0.3213	0.2163	0.1966	0.1148
60	0.5938	0.9207	0.5609	0.6199	0.4588	0.3593	0.3185	0.2142	0.1933	0.1105
61	0.6042	0.9186	0.5593	0.6183	0.4569	0.3577	0.3159	0.2123	0.1899	0.1059
62	0.6146	0.9184	0.5583	0.6176	0.4555	0.3564	0.3133	0.2105	0.1862	0.1018
63	0.6250	0.9185	0.5575	0.6173	0.4544	0.3554	0.3112	0.2090	0.1831	0.0985
64	0.6354	0.9170	0.5567	0.6162	0.4532	0.3546	0.3098	0.2077	0.1813	0.0960
65	0.6458	0.9156	0.5559	0.6151	0.4520	0.3538	0.3083	0.2065	0.1796	0.0936
66	0.6563	0.9146	0.5550	0.6142	0.4508	0.3530	0.3063	0.2049	0.1768	0.0900
67	0.6667	0.9129	0.5540	0.6129	0.4492	0.3521	0.3042	0.2031	0.1738	0.0861
68	0.6771	0.9124	0.5534	0.6123	0.4482	0.3513	0.3026	0.2018	0.1717	0.0836
69	0.6875	0.9120	0.5527	0.6117	0.4472	0.3505	0.3010	0.2005	0.1696	0.0812
70	0.6979	0.9117	0.5521	0.6112	0.4464	0.3500	0.2997	0.1994	0.1676	0.0790
71	0.7083	0.9108	0.5510	0.6101	0.4448	0.3487	0.2973	0.1972	0.1644	0.0754
72	0.7188	0.9098	0.5498	0.6089	0.4432	0.3475	0.2949	0.1950	0.1612	0.0717
73	0.7292	0.9093	0.5489	0.6083	0.4422	0.3468	0.2931	0.1934	0.1583	0.0685
74	0.7396	0.9086	0.5477	0.6074	0.4409	0.3458	0.2908	0.1912	0.1547	0.0645
75	0.7500	0.9069	0.5460	0.6061	0.4394	0.3445	0.2881	0.1883	0.1502	0.0595
76	0.7604	0.9056	0.5445	0.6050	0.4379	0.3433	0.2855	0.1857	0.1459	0.0544
77	0.7708	0.9042	0.5430	0.6039	0.4366	0.3422	0.2828	0.1830	0.1414	0.0494
78	0.7812	0.9012	0.5400	0.6021	0.4353	0.3410	0.2804	0.1800	0.1364	0.0435
79	0.7917	0.8977	0.5366	0.6002	0.4342	0.3399	0.2783	0.1770	0.1316	0.0379
80	0.8021	0.8936	0.5327	0.5982	0.4334	0.3390	0.2770	0.1742	0.1274	0.0331
81	0.8125	0.8895	0.5287	0.5961	0.4326	0.3380	0.2757	0.1715	0.1231	0.0282
82	0.8229	0.8861	0.5261	0.5950	0.4325	0.3374	0.2751	0.1699	0.1206	0.0254
83	0.8333	0.8830	0.5237	0.5940	0.4326	0.3368	0.2747	0.1686	0.1185	0.0231
84	0.8437	0.8781	0.5194	0.5918	0.4318	0.3352	0.2733	0.1659	0.1146	0.0193
85	0.8542	0.8751	0.5173	0.5907	0.4314	0.3339	0.2722	0.1642	0.1126	0.0177
86	0.8646	0.8722	0.5152	0.5895	0.4309	0.3326	0.2711	0.1626	0.1106	0.0161
87	0.8750	0.8688	0.5129	0.5882	0.4305	0.3312	0.2699	0.1607	0.1084	0.0143
88	0.8854	0.8644	0.5101	0.5866	0.4299	0.3297	0.2686	0.1587	0.1057	0.0122
89	0.8958	0.8606	0.5077	0.5856	0.4298	0.3286	0.2678	0.1573	0.1036	0.0107
90	0.9062	0.8561	0.5052	0.5842	0.4297	0.3275	0.2670	0.1557	0.1013	0.0089
91	0.9167	0.8523	0.5034	0.5837	0.4300	0.3265	0.2665	0.1548	0.0996	0.0079
92	0.9271	0.8487	0.5015	0.5831	0.4303	0.3250	0.2657	0.1539	0.0975	0.0069
93	0.9375	0.8446	0.4998	0.5824	0.4304	0.3235	0.2646	0.1530	0.0950	0.0057
94	0.9479	0.8395	0.4980	0.5817	0.4305	0.3219	0.2633	0.1519	0.0918	0.0044
95	0.9583	0.8345	0.4962	0.5810	0.4306	0.3202	0.2620	0.1508	0.0887	0.0030
96	0.9687	0.8295	0.4944	0.5802	0.4306	0.3187	0.2607	0.1496	0.0856	0.0017
97	0.9792	0.8266	0.4935	0.5798	0.4306	0.3177	0.2598	0.1491	0.0836	0.0009
98	0.9896	0.8250	0.4931	0.5796	0.4305	0.3173	0.2594	0.1490	0.0822	0.0005
99	1.0000	0.8234	0.4927	0.5794	0.4305	0.3169	0.2590	0.1490	0.0808	0.0000
100										
101										

d56_k15ss3sc10

-1		0.8886		0.65821	0.23039			
		Upleg Velocity (m/s). Normalised conductivities						
Point no.	y/D	4.5	3.7	2.7	1.9	1.2	0.6	0.4
1								
2								
3	0.0000	0.9239	0.8172	0.7493	0.5753	0.5076	0.5470	0.5479
4	0.0104	0.9272	0.8182	0.7470	0.5728	0.5062	0.5436	0.5442
5	0.0208	0.9302	0.8189	0.7445	0.5702	0.5047	0.5402	0.5404
6	0.0313	0.9332	0.8196	0.7420	0.5676	0.5033	0.5367	0.5367
7	0.0417	0.9361	0.8203	0.7393	0.5646	0.5012	0.5327	0.5324
8	0.0521	0.9406	0.8243	0.7406	0.5678	0.5061	0.5360	0.5356
9	0.0625	0.9421	0.8208	0.7312	0.5585	0.4986	0.5260	0.5251
10	0.0729	0.9427	0.8154	0.7190	0.5458	0.4877	0.5122	0.5108
11	0.0833	0.9437	0.8105	0.7076	0.5338	0.4773	0.4991	0.4972
12	0.0938	0.9457	0.8082	0.6998	0.5263	0.4718	0.4914	0.4891
13	0.1042	0.9455	0.8028	0.6881	0.5166	0.4647	0.4823	0.4796
14	0.1146	0.9453	0.7973	0.6764	0.5068	0.4576	0.4731	0.4701
15	0.1250	0.9428	0.7898	0.6635	0.4969	0.4506	0.4644	0.4611
16	0.1354	0.9403	0.7841	0.6536	0.4915	0.4483	0.4609	0.4574
17	0.1458	0.9397	0.7827	0.6504	0.4920	0.4513	0.4636	0.4600
18	0.1563	0.9409	0.7857	0.6530	0.5008	0.4634	0.4760	0.4726
19	0.1667	0.9389	0.7823	0.6474	0.4989	0.4639	0.4758	0.4725
20	0.1771	0.9316	0.7682	0.6275	0.4787	0.4443	0.4541	0.4503
21	0.1875	0.9302	0.7677	0.6267	0.4822	0.4500	0.4598	0.4561
22	0.1979	0.9319	0.7740	0.6351	0.4973	0.4681	0.4789	0.4755
23	0.2083	0.9336	0.7803	0.6436	0.5124	0.4863	0.4980	0.4949
24	0.2188	0.9353	0.7866	0.6520	0.5275	0.5044	0.5171	0.5143
25	0.2292	0.9398	0.8039	0.6770	0.5667	0.5490	0.5642	0.5622
26	0.2396	0.9514	0.8387	0.7257	0.6375	0.6274	0.6471	0.6466
27	0.2500	0.9744	0.8980	0.8072	0.7503	0.7522	0.7799	0.7817
28	0.2604	0.9939	0.9472	0.8740	0.8421	0.8536	0.8876	0.8914
29	0.2708	1.0000	0.9638	0.8963	0.8724	0.8872	0.9227	0.9270
30	0.2813	0.9957	0.9617	0.8958	0.8749	0.8901	0.9247	0.9290
31	0.2917	0.9818	0.9476	0.8849	0.8674	0.8809	0.9129	0.9165
32	0.3021	0.9647	0.9295	0.8706	0.8564	0.8675	0.8964	0.8991
33	0.3125	0.9475	0.9115	0.8562	0.8455	0.8541	0.8799	0.8818
34	0.3229	0.9248	0.8881	0.8375	0.8308	0.8363	0.8575	0.8582
35	0.3333	0.8983	0.8611	0.8164	0.8138	0.8158	0.8314	0.8308
36	0.3438	0.8811	0.8415	0.8033	0.8043	0.8021	0.8146	0.8128
37	0.3542	0.8611	0.8158	0.7819	0.7840	0.7770	0.7856	0.7825
38	0.3646	0.8410	0.7901	0.7604	0.7637	0.7520	0.7566	0.7521
39	0.3750	0.8209	0.7644	0.7390	0.7435	0.7269	0.7276	0.7217
40	0.3854	0.8009	0.7387	0.7175	0.7232	0.7019	0.6986	0.6913
41	0.3958	0.7904	0.7262	0.7091	0.7162	0.6922	0.6867	0.6787
42	0.4063	0.7871	0.7225	0.7086	0.7168	0.6916	0.6853	0.6769
43	0.4167	0.7855	0.7220	0.7121	0.7220	0.6960	0.6893	0.6807
44	0.4271	0.7849	0.7228	0.7183	0.7299	0.7029	0.6953	0.6863
45	0.4375	0.7883	0.7304	0.7331	0.7476	0.7206	0.7125	0.7034
46	0.4479	0.7894	0.7338	0.7433	0.7605	0.7328	0.7244	0.7149
47	0.4583	0.7935	0.7415	0.7584	0.7786	0.7509	0.7423	0.7326
48	0.4688	0.7952	0.7445	0.7674	0.7897	0.7614	0.7524	0.7423
49	0.4792	0.7914	0.7353	0.7604	0.7823	0.7519	0.7418	0.7311

50	0.4896	0.7905	0.7315	0.7590	0.7810	0.7496	0.7390	0.7278
51	0.5000	0.7904	0.7292	0.7594	0.7818	0.7497	0.7387	0.7270
52	0.5104	0.7870	0.7198	0.7491	0.7700	0.7367	0.7249	0.7127
53	0.5208	0.7844	0.7117	0.7396	0.7588	0.7246	0.7123	0.6996
54	0.5313	0.7813	0.7028	0.7284	0.7459	0.7108	0.6982	0.6851
55	0.5417	0.7775	0.6929	0.7159	0.7318	0.6958	0.6830	0.6695
56	0.5521	0.7737	0.6830	0.7035	0.7177	0.6808	0.6677	0.6539
57	0.5625	0.7692	0.6694	0.6859	0.6973	0.6594	0.6458	0.6314
58	0.5729	0.7620	0.6489	0.6586	0.6656	0.6262	0.6117	0.5964
59	0.5833	0.7566	0.6334	0.6375	0.6410	0.6007	0.5857	0.5697
60	0.5938	0.7506	0.6157	0.6130	0.6127	0.5717	0.5564	0.5399
61	0.6042	0.7445	0.5978	0.5882	0.5842	0.5426	0.5270	0.5098
62	0.6146	0.7404	0.5846	0.5693	0.5620	0.5205	0.5041	0.4864
63	0.6250	0.7371	0.5740	0.5541	0.5443	0.5027	0.4862	0.4682
64	0.6354	0.7327	0.5631	0.5383	0.5267	0.4847	0.4684	0.4501
65	0.6458	0.7281	0.5513	0.5209	0.5068	0.4651	0.4489	0.4304
66	0.6563	0.7233	0.5390	0.5019	0.4852	0.4443	0.4281	0.4093
67	0.6667	0.7189	0.5272	0.4839	0.4652	0.4251	0.4087	0.3894
68	0.6771	0.7149	0.5171	0.4687	0.4484	0.4088	0.3922	0.3726
69	0.6875	0.7128	0.5120	0.4605	0.4395	0.4007	0.3839	0.3640
70	0.6979	0.7099	0.5051	0.4495	0.4273	0.3889	0.3720	0.3519
71	0.7083	0.7065	0.4974	0.4375	0.4140	0.3762	0.3592	0.3388
72	0.7188	0.6996	0.4864	0.4192	0.3944	0.3586	0.3414	0.3208
73	0.7292	0.6915	0.4743	0.3987	0.3727	0.3393	0.3221	0.3012
74	0.7396	0.6848	0.4632	0.3803	0.3532	0.3219	0.3046	0.2833
75	0.7500	0.6778	0.4512	0.3607	0.3327	0.3036	0.2862	0.2646
76	0.7604	0.6708	0.4393	0.3412	0.3123	0.2852	0.2678	0.2458
77	0.7708	0.6604	0.4242	0.3155	0.2850	0.2610	0.2434	0.2210
78	0.7812	0.6464	0.4073	0.2852	0.2529	0.2329	0.2150	0.1922
79	0.7917	0.6365	0.3973	0.2671	0.2341	0.2171	0.1990	0.1761
80	0.8021	0.6232	0.3868	0.2466	0.2133	0.2005	0.1817	0.1586
81	0.8125	0.6081	0.3761	0.2250	0.1915	0.1836	0.1639	0.1405
82	0.8229	0.5952	0.3681	0.2083	0.1744	0.1705	0.1500	0.1266
83	0.8333	0.5859	0.3641	0.1985	0.1640	0.1628	0.1413	0.1178
84	0.8437	0.5782	0.3609	0.1905	0.1551	0.1561	0.1336	0.1101
85	0.8542	0.5732	0.3593	0.1856	0.1495	0.1519	0.1284	0.1046
86	0.8646	0.5683	0.3580	0.1810	0.1441	0.1478	0.1234	0.0992
87	0.8750	0.5604	0.3558	0.1742	0.1360	0.1422	0.1165	0.0920
88	0.8854	0.5544	0.3547	0.1698	0.1297	0.1376	0.1106	0.0860
89	0.8958	0.5491	0.3538	0.1658	0.1235	0.1330	0.1047	0.0799
90	0.9062	0.5439	0.3528	0.1618	0.1175	0.1286	0.0990	0.0739
91	0.9167	0.5386	0.3518	0.1578	0.1113	0.1239	0.0931	0.0678
92	0.9271	0.5325	0.3509	0.1539	0.1026	0.1171	0.0843	0.0593
93	0.9375	0.5279	0.3502	0.1506	0.0954	0.1115	0.0771	0.0520
94	0.9479	0.5235	0.3496	0.1474	0.0885	0.1060	0.0701	0.0450
95	0.9583	0.5204	0.3486	0.1440	0.0798	0.0987	0.0612	0.0359
96	0.9687	0.5174	0.3475	0.1405	0.0707	0.0908	0.0517	0.0262
97	0.9792	0.5132	0.3463	0.1368	0.0610	0.0827	0.0418	0.0165
98	0.9896	0.5092	0.3450	0.1329	0.0513	0.0746	0.0319	0.0066
99	1.0000	0.5054	0.3440	0.1303	0.0445	0.0688	0.0251	0.0000
100								
101								

d56_k15ss3sc20

-1		1.0183	0.69858	0.31972				
		Upleg velocity (m/s). Normalised conductivities						
Point no.	y/D	4.2	3.4	2.5	1.8	1.0	0.6	0.5
1								
2								
3	0.0000	0.7827	0.7714	0.8309	0.8547	0.8699	0.8506	0.8520
4	0.0104	0.7850	0.7721	0.8302	0.8509	0.8648	0.8451	0.8462
5	0.0208	0.7870	0.7726	0.8293	0.8466	0.8592	0.8392	0.8400
6	0.0313	0.7890	0.7731	0.8283	0.8425	0.8536	0.8333	0.8338
7	0.0417	0.7911	0.7736	0.8273	0.8383	0.8481	0.8273	0.8276
8	0.0521	0.7949	0.7761	0.8292	0.8391	0.8486	0.8277	0.8276
9	0.0625	0.7962	0.7734	0.8210	0.8253	0.8328	0.8112	0.8109
10	0.0729	0.7967	0.7692	0.8101	0.8077	0.8126	0.7903	0.7898
11	0.0833	0.7975	0.7655	0.8002	0.7912	0.7934	0.7705	0.7697
12	0.0938	0.7994	0.7637	0.7930	0.7787	0.7792	0.7558	0.7548
13	0.1042	0.8000	0.7593	0.7810	0.7614	0.7601	0.7363	0.7351
14	0.1146	0.8005	0.7548	0.7690	0.7440	0.7411	0.7168	0.7154
15	0.1250	0.7995	0.7489	0.7550	0.7248	0.7205	0.6958	0.6944
16	0.1354	0.7988	0.7440	0.7431	0.7093	0.7043	0.6795	0.6781
17	0.1458	0.7994	0.7428	0.7381	0.7030	0.6981	0.6735	0.6720
18	0.1563	0.8019	0.7446	0.7379	0.7032	0.6994	0.6754	0.6738
19	0.1667	0.8015	0.7420	0.7306	0.6942	0.6903	0.6662	0.6646
20	0.1771	0.7962	0.7316	0.7111	0.6693	0.6633	0.6380	0.6364
21	0.1875	0.7965	0.7313	0.7082	0.6664	0.6609	0.6358	0.6342
22	0.1979	0.7997	0.7359	0.7134	0.6742	0.6706	0.6463	0.6446
23	0.2083	0.8028	0.7406	0.7187	0.6819	0.6802	0.6567	0.6549
24	0.2188	0.8059	0.7452	0.7239	0.6897	0.6898	0.6672	0.6653
25	0.2292	0.8129	0.7579	0.7418	0.7157	0.7205	0.6998	0.6977
26	0.2396	0.8278	0.7851	0.7813	0.7710	0.7840	0.7661	0.7636
27	0.2500	0.8537	0.8296	0.8482	0.8613	0.8869	0.8746	0.8715
28	0.2604	0.8754	0.8667	0.9038	0.9358	0.9716	0.9638	0.9600
29	0.2708	0.8830	0.8802	0.9232	0.9612	1.0000	0.9933	0.9892
30	0.2813	0.8809	0.8801	0.9220	0.9602	0.9988	0.9915	0.9873
31	0.2917	0.8707	0.8720	0.9103	0.9470	0.9834	0.9742	0.9701
32	0.3021	0.8578	0.8614	0.8951	0.9298	0.9633	0.9517	0.9478
33	0.3125	0.8448	0.8507	0.8799	0.9125	0.9431	0.9292	0.9255
34	0.3229	0.8283	0.8381	0.8612	0.8903	0.9168	0.8994	0.8958
35	0.3333	0.8091	0.8240	0.8403	0.8650	0.8863	0.8649	0.8613
36	0.3438	0.7944	0.8110	0.8255	0.8478	0.8653	0.8416	0.8386
37	0.3542	0.7772	0.7940	0.8038	0.8213	0.8339	0.8074	0.8049
38	0.3646	0.7600	0.7771	0.7820	0.7949	0.8025	0.7731	0.7711
39	0.3750	0.7428	0.7601	0.7602	0.7685	0.7711	0.7389	0.7374
40	0.3854	0.7255	0.7432	0.7384	0.7420	0.7397	0.7046	0.7036
41	0.3958	0.7165	0.7353	0.7296	0.7310	0.7258	0.6892	0.6885
42	0.4063	0.7134	0.7333	0.7289	0.7296	0.7231	0.6859	0.6854
43	0.4167	0.7120	0.7338	0.7320	0.7327	0.7253	0.6878	0.6874
44	0.4271	0.7114	0.7354	0.7376	0.7379	0.7289	0.6908	0.6907
45	0.4375	0.7145	0.7421	0.7512	0.7525	0.7426	0.7046	0.7047
46	0.4479	0.7151	0.7453	0.7603	0.7622	0.7512	0.7131	0.7135
47	0.4583	0.7187	0.7521	0.7743	0.7773	0.7654	0.7273	0.7280
48	0.4688	0.7196	0.7548	0.7825	0.7858	0.7726	0.7342	0.7353
49	0.4792	0.7146	0.7468	0.7755	0.7768	0.7612	0.7222	0.7239

50	0.4896	0.7127	0.7437	0.7744	0.7747	0.7576	0.7182	0.7203
51	0.5000	0.7117	0.7420	0.7752	0.7748	0.7565	0.7167	0.7192
52	0.5104	0.7072	0.7340	0.7660	0.7637	0.7438	0.7033	0.7063
53	0.5208	0.7039	0.7267	0.7573	0.7532	0.7321	0.6912	0.6945
54	0.5313	0.6999	0.7181	0.7463	0.7408	0.7188	0.6776	0.6813
55	0.5417	0.6954	0.7087	0.7341	0.7272	0.7044	0.6630	0.6671
56	0.5521	0.6908	0.6994	0.7220	0.7136	0.6900	0.6485	0.6529
57	0.5625	0.6852	0.6869	0.7055	0.6948	0.6700	0.6279	0.6329
58	0.5729	0.6767	0.6679	0.6798	0.6655	0.6388	0.5960	0.6017
59	0.5833	0.6706	0.6535	0.6598	0.6429	0.6149	0.5716	0.5778
60	0.5938	0.6637	0.6357	0.6354	0.6162	0.5873	0.5438	0.5508
61	0.6042	0.6568	0.6178	0.6109	0.5893	0.5596	0.5159	0.5235
62	0.6146	0.6524	0.6055	0.5933	0.5694	0.5387	0.4944	0.5026
63	0.6250	0.6488	0.5945	0.5778	0.5527	0.5215	0.4773	0.4860
64	0.6354	0.6442	0.5828	0.5612	0.5352	0.5041	0.4602	0.4691
65	0.6458	0.6397	0.5697	0.5425	0.5158	0.4849	0.4413	0.4506
66	0.6563	0.6357	0.5560	0.5224	0.4950	0.4644	0.4211	0.4309
67	0.6667	0.6317	0.5441	0.5042	0.4760	0.4455	0.4021	0.4124
68	0.6771	0.6280	0.5337	0.4887	0.4598	0.4295	0.3861	0.3967
69	0.6875	0.6264	0.5287	0.4804	0.4514	0.4213	0.3777	0.3886
70	0.6979	0.6240	0.5212	0.4690	0.4397	0.4097	0.3661	0.3772
71	0.7083	0.6211	0.5131	0.4565	0.4267	0.3970	0.3534	0.3648
72	0.7188	0.6167	0.4997	0.4355	0.4067	0.3782	0.3352	0.3467
73	0.7292	0.6118	0.4846	0.4116	0.3843	0.3575	0.3150	0.3268
74	0.7396	0.6073	0.4715	0.3908	0.3644	0.3389	0.2968	0.3089
75	0.7500	0.6026	0.4575	0.3688	0.3434	0.3193	0.2777	0.2901
76	0.7604	0.5978	0.4434	0.3468	0.3223	0.2998	0.2585	0.2714
77	0.7708	0.5914	0.4247	0.3170	0.2941	0.2735	0.2330	0.2461
78	0.7812	0.5835	0.4022	0.2806	0.2602	0.2423	0.2029	0.2160
79	0.7917	0.5784	0.3877	0.2574	0.2398	0.2240	0.1854	0.1985
80	0.8021	0.5719	0.3710	0.2305	0.2167	0.2036	0.1661	0.1789
81	0.8125	0.5647	0.3534	0.2016	0.1922	0.1821	0.1457	0.1583
82	0.8229	0.5592	0.3400	0.1787	0.1732	0.1652	0.1296	0.1415
83	0.8333	0.5554	0.3323	0.1649	0.1615	0.1548	0.1195	0.1310
84	0.8437	0.5523	0.3266	0.1543	0.1522	0.1460	0.1108	0.1218
85	0.8542	0.5502	0.3236	0.1483	0.1464	0.1404	0.1050	0.1160
86	0.8646	0.5481	0.3208	0.1428	0.1409	0.1350	0.0993	0.1103
87	0.8750	0.5448	0.3158	0.1336	0.1325	0.1269	0.0912	0.1019
88	0.8854	0.5423	0.3123	0.1272	0.1264	0.1206	0.0849	0.0954
89	0.8958	0.5400	0.3095	0.1219	0.1208	0.1145	0.0786	0.0889
90	0.9062	0.5378	0.3067	0.1166	0.1152	0.1086	0.0724	0.0826
91	0.9167	0.5356	0.3039	0.1113	0.1097	0.1026	0.0661	0.0761
92	0.9271	0.5334	0.3010	0.1058	0.1029	0.0942	0.0574	0.0669
93	0.9375	0.5316	0.2987	0.1014	0.0974	0.0875	0.0504	0.0596
94	0.9479	0.5299	0.2964	0.0971	0.0920	0.0809	0.0435	0.0525
95	0.9583	0.5286	0.2945	0.0927	0.0854	0.0728	0.0347	0.0441
96	0.9687	0.5273	0.2925	0.0882	0.0784	0.0643	0.0256	0.0353
97	0.9792	0.5257	0.2901	0.0829	0.0712	0.0554	0.0163	0.0256
98	0.9896	0.5241	0.2876	0.0776	0.0637	0.0460	0.0069	0.0163
99	1.0000	0.5227	0.2856	0.0729	0.0581	0.0394	0.0000	0.0091
100								
101								

d56_k15ss3sc30

-1		0.98409	0.55445	0.42964			
		Upleg velocity (m/s). Normalised conductivities					
Point no.	y/D	3.8	2.8	1.9	1.3	0.9	0.5
1							
2							
3	0.0000	0.6784	0.7202	0.7679	0.8342	0.8900	0.9227
4	0.0104	0.6801	0.7222	0.7696	0.8343	0.8891	0.9211
5	0.0208	0.6816	0.7240	0.7709	0.8339	0.8877	0.9190
6	0.0313	0.6830	0.7258	0.7722	0.8336	0.8862	0.9169
7	0.0417	0.6845	0.7275	0.7734	0.8332	0.8848	0.9148
8	0.0521	0.6877	0.7308	0.7773	0.8366	0.8875	0.9169
9	0.0625	0.6889	0.7290	0.7721	0.8280	0.8770	0.9051
10	0.0729	0.6896	0.7257	0.7645	0.8163	0.8630	0.8896
11	0.0833	0.6905	0.7229	0.7577	0.8055	0.8502	0.8753
12	0.0938	0.6926	0.7217	0.7531	0.7978	0.8406	0.8644
13	0.1042	0.6937	0.7173	0.7440	0.7848	0.8255	0.8477
14	0.1146	0.6948	0.7129	0.7348	0.7719	0.8104	0.8310
15	0.1250	0.6948	0.7066	0.7232	0.7562	0.7925	0.8115
16	0.1354	0.6949	0.7011	0.7132	0.7429	0.7773	0.7948
17	0.1458	0.6964	0.6995	0.7092	0.7375	0.7708	0.7874
18	0.1563	0.6996	0.7007	0.7095	0.7370	0.7696	0.7857
19	0.1667	0.7003	0.6976	0.7035	0.7292	0.7605	0.7755
20	0.1771	0.6968	0.6868	0.6869	0.7086	0.7378	0.7509
21	0.1875	0.6982	0.6860	0.6847	0.7057	0.7341	0.7464
22	0.1979	0.7023	0.6903	0.6899	0.7115	0.7397	0.7518
23	0.2083	0.7063	0.6945	0.6950	0.7173	0.7454	0.7572
24	0.2188	0.7104	0.6987	0.7001	0.7230	0.7510	0.7625
25	0.2292	0.7188	0.7106	0.7166	0.7427	0.7713	0.7829
26	0.2396	0.7368	0.7381	0.7555	0.7894	0.8198	0.8315
27	0.2500	0.7643	0.7823	0.8173	0.8629	0.8970	0.9106
28	0.2604	0.7876	0.8195	0.8692	0.9244	0.9616	0.9766
29	0.2708	0.7972	0.8343	0.8890	0.9473	0.9850	1.0000
30	0.2813	0.7981	0.8355	0.8900	0.9478	0.9843	0.9980
31	0.2917	0.7933	0.8305	0.8827	0.9380	0.9717	0.9826
32	0.3021	0.7866	0.8235	0.8728	0.9249	0.9551	0.9628
33	0.3125	0.7800	0.8165	0.8628	0.9118	0.9385	0.9430
34	0.3229	0.7729	0.8096	0.8518	0.8962	0.9180	0.9179
35	0.3333	0.7654	0.8028	0.8402	0.8790	0.8948	0.8891
36	0.3438	0.7552	0.7947	0.8291	0.8638	0.8763	0.8677
37	0.3542	0.7431	0.7826	0.8121	0.8414	0.8499	0.8380
38	0.3646	0.7311	0.7705	0.7950	0.8191	0.8236	0.8083
39	0.3750	0.7190	0.7584	0.7779	0.7967	0.7972	0.7786
40	0.3854	0.7069	0.7463	0.7608	0.7743	0.7709	0.7489
41	0.3958	0.7008	0.7420	0.7543	0.7647	0.7591	0.7352
42	0.4063	0.6987	0.7424	0.7541	0.7632	0.7566	0.7320
43	0.4167	0.6983	0.7452	0.7572	0.7654	0.7581	0.7330
44	0.4271	0.6983	0.7497	0.7618	0.7682	0.7601	0.7345
45	0.4375	0.7016	0.7596	0.7732	0.7787	0.7702	0.7445
46	0.4479	0.7023	0.7664	0.7811	0.7855	0.7764	0.7503
47	0.4583	0.7055	0.7763	0.7925	0.7960	0.7866	0.7605
48	0.4688	0.7060	0.7823	0.7992	0.8012	0.7913	0.7650
49	0.4792	0.6996	0.7774	0.7924	0.7920	0.7811	0.7540

50	0.4896	0.6968	0.7768	0.7911	0.7890	0.7775	0.7501
51	0.5000	0.6950	0.7778	0.7916	0.7881	0.7760	0.7483
52	0.5104	0.6893	0.7714	0.7832	0.7779	0.7653	0.7370
53	0.5208	0.6843	0.7648	0.7749	0.7682	0.7551	0.7266
54	0.5313	0.6784	0.7563	0.7646	0.7567	0.7434	0.7147
55	0.5417	0.6721	0.7470	0.7536	0.7448	0.7311	0.7022
56	0.5521	0.6657	0.7377	0.7426	0.7328	0.7189	0.6897
57	0.5625	0.6574	0.7253	0.7274	0.7160	0.7017	0.6721
58	0.5729	0.6449	0.7058	0.7034	0.6898	0.6749	0.6449
59	0.5833	0.6354	0.6901	0.6844	0.6692	0.6539	0.6237
60	0.5938	0.6236	0.6701	0.6610	0.6444	0.6291	0.5988
61	0.6042	0.6117	0.6498	0.6374	0.6194	0.6040	0.5737
62	0.6146	0.6037	0.6356	0.6196	0.6003	0.5847	0.5544
63	0.6250	0.5964	0.6223	0.6043	0.5843	0.5688	0.5386
64	0.6354	0.5885	0.6081	0.5884	0.5682	0.5530	0.5229
65	0.6458	0.5797	0.5912	0.5699	0.5495	0.5346	0.5049
66	0.6563	0.5706	0.5727	0.5493	0.5288	0.5143	0.4850
67	0.6667	0.5628	0.5569	0.5308	0.5104	0.4961	0.4669
68	0.6771	0.5559	0.5434	0.5152	0.4949	0.4807	0.4516
69	0.6875	0.5526	0.5359	0.5066	0.4864	0.4724	0.4433
70	0.6979	0.5477	0.5256	0.4948	0.4747	0.4609	0.4320
71	0.7083	0.5423	0.5144	0.4818	0.4619	0.4483	0.4195
72	0.7188	0.5329	0.4933	0.4597	0.4410	0.4281	0.3999
73	0.7292	0.5222	0.4685	0.4340	0.4172	0.4052	0.3776
74	0.7396	0.5130	0.4477	0.4115	0.3961	0.3848	0.3576
75	0.7500	0.5033	0.4259	0.3880	0.3742	0.3637	0.3369
76	0.7604	0.4936	0.4041	0.3646	0.3523	0.3425	0.3162
77	0.7708	0.4803	0.3733	0.3319	0.3218	0.3131	0.2875
78	0.7812	0.4639	0.3340	0.2911	0.2839	0.2767	0.2522
79	0.7917	0.4530	0.3076	0.2652	0.2607	0.2546	0.2310
80	0.8021	0.4402	0.2753	0.2338	0.2330	0.2284	0.2056
81	0.8125	0.4263	0.2399	0.1993	0.2029	0.1998	0.1780
82	0.8229	0.4153	0.2111	0.1721	0.1790	0.1771	0.1561
83	0.8333	0.4086	0.1928	0.1544	0.1632	0.1620	0.1415
84	0.8437	0.4036	0.1788	0.1404	0.1504	0.1496	0.1294
85	0.8542	0.4009	0.1707	0.1313	0.1420	0.1413	0.1211
86	0.8646	0.3984	0.1630	0.1224	0.1337	0.1332	0.1129
87	0.8750	0.3937	0.1499	0.1089	0.1215	0.1213	0.1011
88	0.8854	0.3903	0.1407	0.0996	0.1129	0.1127	0.0924
89	0.8958	0.3875	0.1332	0.0916	0.1051	0.1048	0.0842
90	0.9062	0.3848	0.1257	0.0835	0.0974	0.0969	0.0762
91	0.9167	0.3821	0.1183	0.0756	0.0897	0.0891	0.0682
92	0.9271	0.3791	0.1111	0.0690	0.0825	0.0811	0.0597
93	0.9375	0.3767	0.1054	0.0629	0.0760	0.0740	0.0522
94	0.9479	0.3745	0.0999	0.0569	0.0696	0.0671	0.0449
95	0.9583	0.3724	0.0955	0.0507	0.0623	0.0588	0.0360
96	0.9687	0.3703	0.0912	0.0444	0.0547	0.0503	0.0268
97	0.9792	0.3677	0.0856	0.0379	0.0470	0.0416	0.0174
98	0.9896	0.3651	0.0800	0.0309	0.0388	0.0324	0.0076
99	1.0000	0.3625	0.0745	0.0252	0.0322	0.0250	0.0000
100							
101							