



VIEWZ 1.3 USER MANUAL

ViewZ 1.3.0 User Manual

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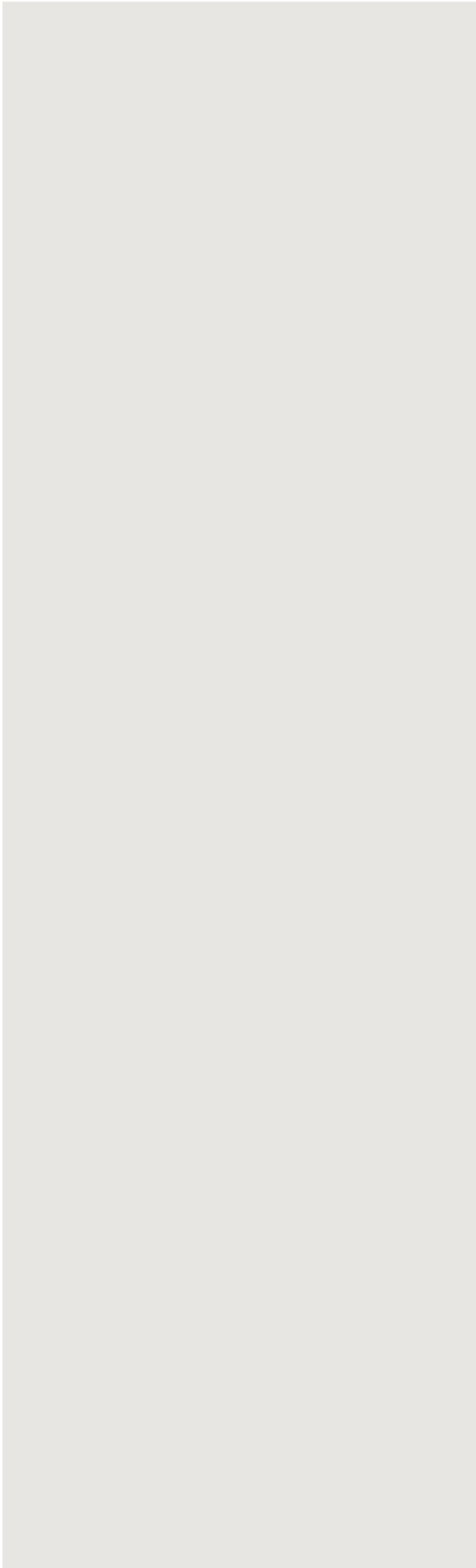
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CHAPTER I

THE INTERFACE

1.1 MAIN WINDOW

This is the window that comes up on starting the application. A smaller splash window may appear for a brief moment before the main window shows up.

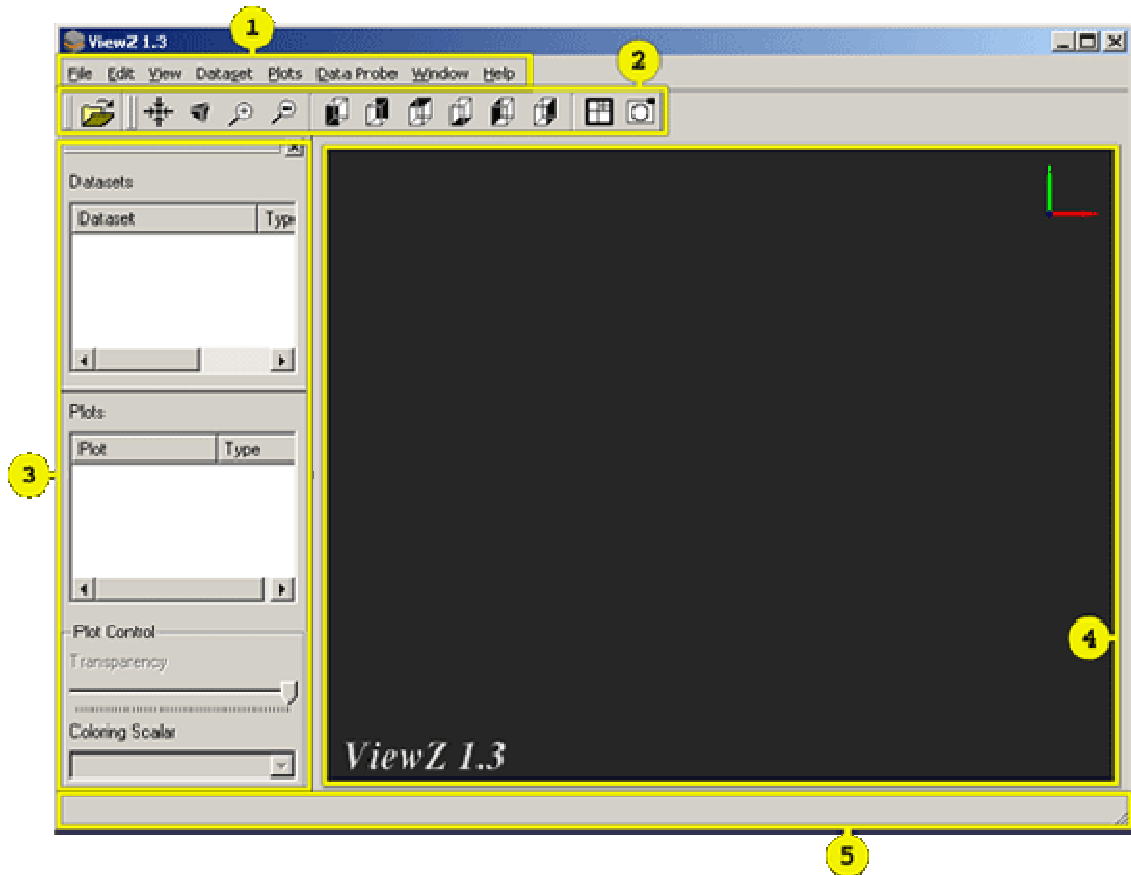


Figure 1.1 - The Main Window

1. Menu-bar
2. Toolbar
3. Control Panel
4. Rendering Canvas
5. Status-bar

The main window looks like most other application windows and is composed of a menu- bar, toolbars, the control panel and a rendering area called the rendering canvas or simply canvas. As is common, the menu-bar and the toolbar are located near the top of the main window.

1.1.1 PANELS

The various sub-windows that may appear when performing different tasks are called panels. One important panel is the *Control Panel* (§1.4) which appears in the main window by default. It's the only panel that may be docked into the main window. The control panel displays the dataset list the plot list and the plot controls. These provide important information and the means to manipulate opened files and the output of various imaging algorithms. The different panels for individual imaging algorithms are explained in their respective sections in chapter II.

1.2 MENUS

This section lists the various menus and their function in brief along with other useful info.

1.2.1 FILE MENU

Open - [Ctrl+O]

Brings up the *open file* dialog box. If any file is open at the time, the program will warn with a message box that opening a new file will close the current one. To continue to open a new file, one must confirm by clicking on the *OK* button. To know about the types of files and datasets supported by this edition of ViewZ see §1.6.

Close - [Ctrl+C]

Closes any file that's open at the time.

Capture screen

Saves the image on the rendering canvas to disk in either PNG or TGA format.

Import Data for Graph

Brings up the *Import Graph Data File* panel (§3.1).

Recent Files

Displays a sub-menu which lists a few of the files that were loaded recently. Clicking any of the entries on this sub-menu will load that particular file. Pressing the F5 key will re-load the most recent file. This feature may be configured from the *User Preferences* panel (§3.3).

1.2.2 EDIT MENU

Preferences

Brings up the *Preferences* panel (§3.3)..

1.2.3 VIEW MENU

Fullscreen - [F11]

Toggles between normal and full-screen window modes. This applies only to the main window.

Perspective/Orthographic Mode - [Ctrl+M]

Toggles between perspective and orthographic projection modes of rendering. When in orthographic mode this menu item will show the text *Perspective Mode* indicating that clicking on it will change the projection mode to perspective and vice versa.

Reset View - [Q]

Resets the view and zoom level so that the object origin is centred to the screen with the positive z-axis pointing outwards from the screen.

Isometric View - [W]

Sets the view so that the object is seen at and isometric orientation.

Zoom in - [Z]

Zooms into the current view.

Zoom out - [X]

Zooms out of the current view.

Front view - [F]

Sets the current view so that the positive z-axis is pointing outward from the screen.

Back view - [E]

Sets the current view so that the negative z-axis is pointing outward from the screen.

Top view - [R]

Sets the current view so that the positive y-axis is pointing outward from the screen.

Bottom view - [V]

Sets the current view so that the negative y-axis is pointing outward from the screen.

Left view - [D]

Sets the current view so that the negative x-axis is pointing outward from the screen.

Right view - [G]

Sets the current view so that the positive x-axis is pointing outward from the screen.

1.2.4 DATASET MENU

Extract Dataset

Brings up the *Extract Dataset* (§3.2.1) panel. This is available only for 3-D datasets.

1.2.5 PLOTS MENU

Boundary Plot - [Ctrl+1]

Brings up the *New Boundary Plot* panel that allows addition of boundary plots (§2.5) to available boundaries on a 3-D dataset.

Labels - [Ctrl+2]

Brings up the panel that allows addition of label plots (§2.6) to the labels specified for the object. This is available only for 3-D datasets.

Colour Plot - [Ctrl+3]

Brings up the *Colour Plot Options* panel that allows addition of colour plots (§2.7) to a surface. This is available only for 2-D datasets.

Section Plane - [Ctrl+4]

Brings up the *New Section* panel where parameters for the section plane (§2.8) to be added to the domain may be specified. This is available only for 3-D datasets.

Vectors - [Ctrl+5]

Brings up the *Vector Plot* panel (§2.9) that allows adding vector glyphs to the dataset.

Iso-lines - [Ctrl+6]

Brings the *Iso-line Options* panel that allows addition of iso-lines (§2.10) to the dataset. This is only available for 2-D datasets. For iso-lines on 3-D datasets see §2.8.1.

Iso-surfaces - [Ctrl+7]

Brings up the *Iso-surface Options* panel that allows addition of an iso-surface (§2.11) to the dataset. This is only available for 3-D datasets.

Streamlines - [Ctrl+8]

Brings up the *Streamlines* panel that allows addition of streamlines (§2.12) to the current dataset. This is available only for 3-D datasets.

Surface Streamlines

Brings up the *Surface Streamlines* panel where the surfaces for plotting these streamlines (§2.13) may be chosen.

1.2.6 DATA PROBE MENU

The commands in this menu are only available for 3-D structured datasets.

Line Probe

Brings up the *Line Probe* (§3.4) panel.

Line on Surface Probe

Brings up the *Line on Surface Probe* (§3.5) panel

Point Probe

Brings up the *Point Probe* (§3.6) panel.

1.2.7 WINDOW MENU

This menu contains commands that allow controlling the visibility of the toolbars and the control panel.

Control Panel

Shows/hides the *Control Panel* (§1.4). A check mark by this menu entry will be present to indicate that the control panel is visible.

Toolbars

This menu entry leads to a sub-menu with commands that show/hide individual toolbars.

1.2.8 HELP MENU

Provides commands for invoking the user manual and the about box.

Contents - [F1]

Invokes the browser to open the HTML help contents page. For this to work, the browser to be used must be specified in the *User Preferences* panel (§3.3).

About

Displays the about box with some information about the program version.

1.3 TOOLBARS

Toolbars provide shortcut buttons to frequently used functions. There are two toolbars on the main window – *File Management* and *View Controls*.













1.3.1 FILE MANAGEMENT



Open File

- [Ctrl+O]

1.3.2 VIEW CONTROLS

| | | |
|---|-------------------------|---------|
|  | Reset View | - [Q] |
|  | Isometric View | - [W] |
|  | Zoom In | - [Z] |
|  | Zoom Out | - [X] |
|  | Front View | - [F] |
|  | Back View | - [E] |
|  | Top View | - [R] |
|  | Bottom View | - [V] |
|  | Left View | - [D] |
|  | Right View | - [G] |
|  | Toggle Block Boundaries | |
|  | Capture Screen | |

1.4 CONTROL PANEL

The control panel is the most useful panel on the main window. It provides two lists that keep track of all operations performed and the ability to manipulate parameters of various plots added during the session.

1.4.1 THE DATASETS LIST

A list of datasets opened is maintained here. Although the current version of ViewZ only allows one dataset to be open in one instance, this list also displays runtime generated datasets from *Line Probe* (§3.4) and *XY plots* (§2.14) and others. There are two columns in this list, a *Dataset* column that shows the names of the dataset and a *Type* column that indicates the type of dataset.

In case of multiblock datasets, double clicking on the dataset entry will expand the list revealing blocks within.

Seeing Dataset Details

Right click on entries in this list and select *Details* from the context menu to see dataset/block related information.

1.4.2 THE PLOTS LIST

All plots added to the dataset are listed here and the panels for manipulating them may be brought up by double clicking on the corresponding list entry. Each entry has a check-box associated with it that controls visibility of that plot. Un-checking this will hide that particular plot in the rendering canvas. There are two columns in this list, a *Plot* column that names the plot and the *Type* column that indicates the type of the plot.

Context menu options

Right click on a list entry to bring up the context menu. It contains a *Rename* command that allow renaming a plot, a *Details* command that brings up a dialog with some information about the plot and a *Properties* command which has the same effect as double clicking on the entry.

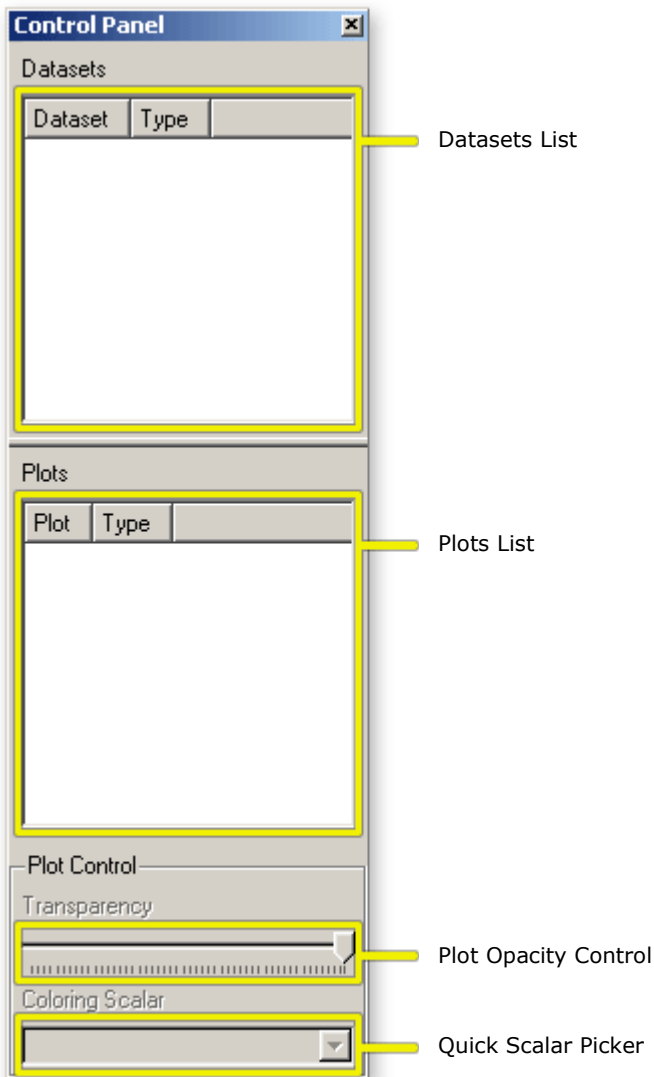


Figure 1.2 - The Control Panel

plot is to be coloured by. Most plots have a similar scalar picker in their properties panel. The QSP is meant to be a short-cut method for changing the colouring scalar. To switch the colouring scalar for a plot, select its entry in the plots list and then select the desired scalar using the QSP.

1.5 RENDERING CANVAS

This is the 3-D viewport on the main window where all the graphical results are drawn. ViewZ uses OpenGL for drawing.

1.5.1 INTERACTING USING THE MOUSE

It is possible to use the mouse to perform some very frequently performed actions on the rendered dataset. These are:

Panning

Drag within the rendering canvas with the LMB to move the object in plane of the screen.

Rotating

Drag within the rendering canvas with the MMB to rotate the object about its origin.

Default Plots

On opening a dataset file, a few plots are added by default to the plots list. These are:

1. The Legend (§2.1)
2. Main outline (an outline plot, §2.2)
3. A Text plot (§2.4) indicating the file-path of the dataset opened.

Additionally:

4. Main mesh (a mesh plot, §2.3), in case of unstructured datasets.
5. Boundary plot (§2.5) in case of 3-D unstructured datasets.

1.4.3 PLOT OPACITY CONTROL

This slider allows changing the opacity of plots. To change the opacity for a plot, select its entry in the plots list and drag this slider till the desirable effect is achieved. This is available only for some of the plots and will be disabled for others.

1.4.4 QUICK SCALAR PICKER

This dropdown list enumerates the various scalar fields for which data is available in the dataset opened. It may be used to select that scalar that any

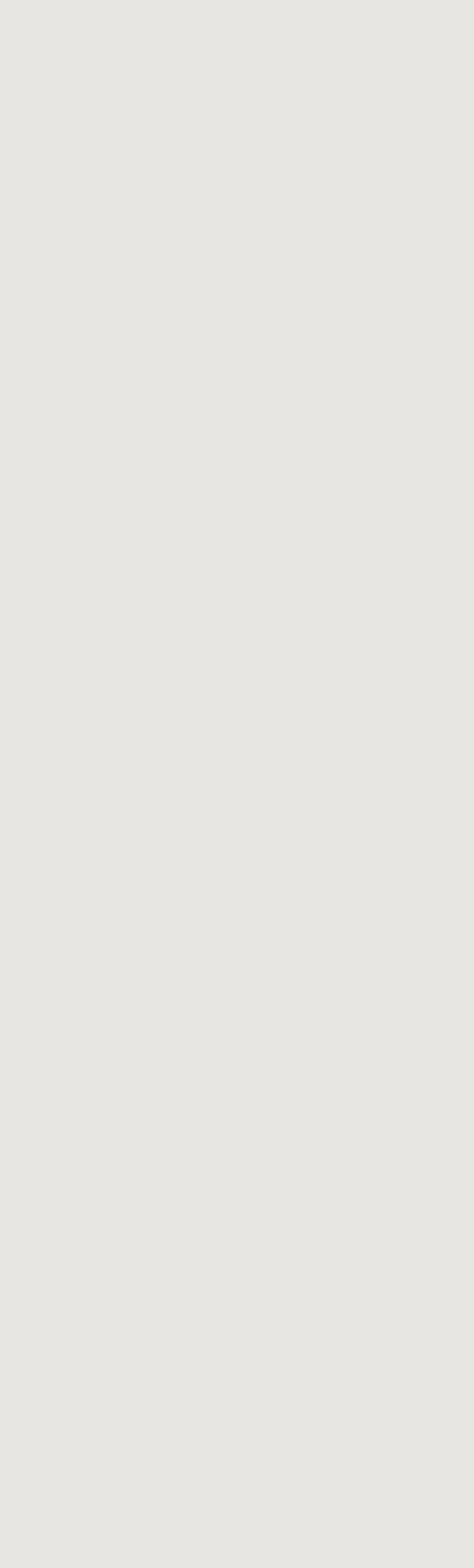
Zooming

Drag within the rendering canvas with the RMB to draw a zoom window. Releasing the RMB will cause the view to zoom into the specified zoom window.

1.6 FILE SUPPORT

ViewZ currently supports datasets written in the CGNS (CFD General Notation System) file format. Furthermore, only the following types of datasets are supported:

- 2-D Structured datasets
- 2-D Unstructured datasets
- 3-D Structured, single and multi block datasets
- 3-D Unstructured, single and multi block datasets (tetrahedron and hexahedron cells).



CHAPTER II

VISUALISATION

Everything that is drawn in the rendering area is a plot. Each of these may be manipulated via their respective panels which may be invoked by double clicking the plot entry in the plot list. This chapter explains all the available plots and their panels.

2.1 LEGEND

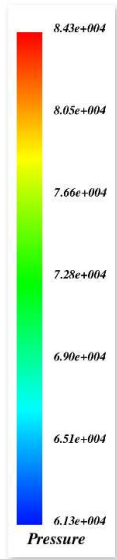


Figure 2.1 - Legend

The legend displays the colour-map being used for showing scalars in other plots along with calibration markings. This plot is added automatically by ViewZ whenever a dataset is opened and there can be only one instance of the legend on the rendering canvas.

Legend Options

Double clicking on the legend entry in the plots list brings up the *Legend Options* panel. This panel allows setting the number format to either standard or scientific and it allows setting the precision and the number of calibration markings.

2.2 OUTLINE PLOT

The outline plot for a dataset (main outline) displays a bounding box about the domain. For multiblock datasets an outline plot is added for each block and displays the block outline instead of a bounding box around it. The outline plot for the dataset is listed in the plots list (§1.4.2)

and may be turned off by un-checking it. Plot list entries for outline plots for individual blocks may be seen when the corresponding block is selected in the expanded dataset list (§1.4.1). These are un-checked by default and must be made visible by hand. All outline plots are added automatically when a dataset is opened.

2.3 MESH PLOT

Added by default for unstructured datasets, a mesh plot renders the mesh lines in the dataset. By default the mesh plot is rendered with opacity of 15%. This may be changed by using the default mesh opacity setting in the *User Preferences* panel (§3.3).

2.4 TEXT PLOT

For displaying text on the rendering canvas, text plots may be used. To add a text plot, select the *Text Plot* command from the plots menu. The text plot properties panel may be brought up by double-clicking the corresponding entry in the plots list. The font, font size and colour for the text may be specified using the properties panel as well as the text to be displayed itself may also be edited here.

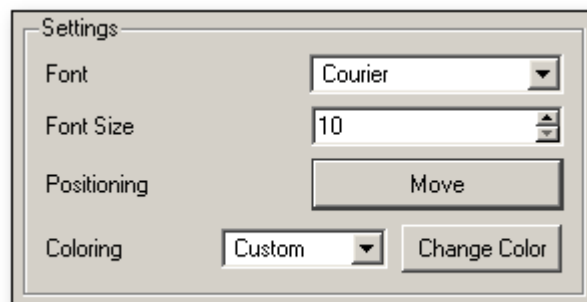


Figure 2.2 - Text plot settings

The positioning of the text plot may be done by clicking on the *Move* button. This

temporarily hides the properties panel and allows one to use the mouse to move the text on screen. Click with the LMB on the desired point in the rendering area where the text plot is to be located.

2.5 BOUNDARY PLOT

Boundary plots visualise boundary conditions. It is available via the *New Boundary Plot* panel that may be invoked from the *Plots* menu. This panel lists the available boundaries and to add one, select it from the list and click on the *Add* button. Multiple plots may be added this way. Each boundary plot added is listed in the plots list in the control panel.

2.5.1 VISUALISING SCALARS ON THE BOUNDARY

A newly added boundary plot is by default shaded with a constant colour. To change this, double-click on its entry in the plots list to bring up the *Boundary Plot Settings* panel. Here among other parameters, one may specify the scalar quantity that the boundary should be coloured by. A drop down list allows selection of the desired scalar. Ensure that the *Show Scalar* check box is checked. Now click *Apply* or *OK* to save this change.

2.6 LABELS

Labels are specified during the grid generation stage. They are used to identify boundary faces having the same boundary type and conditions. Label plots allow visualisation of these labels. To add a label plot invoke the *Labels* command from the plots menu. The *New Label Plot* panel lists the labels that are available and to add a plot for any of these, select it in the list and click the *Add* button.

2.6.1 VISUALISING SCALARS AND ISO-LINES ON LABELS

Double-click on the label plot entry in the plots list to invoke its properties panel. Here select the desired scalar quantity in the *Choose Field* drop down list. Iso-lines may also be shown on labels. To enable them, enter the number of lines that must be shown in the *Number of contours* field and click the *OK* button.

2.7 COLOUR PLOT

Available for 2-D datasets, this plot colours the surface by a specified scalar. To add a colour plot, invoke the *Colour* command from the plots menu. Only the scalar to use for colouring needs to be specified when adding this plot. Double clicking its plot list entry brings up the properties panel where the scalar being may be changed.

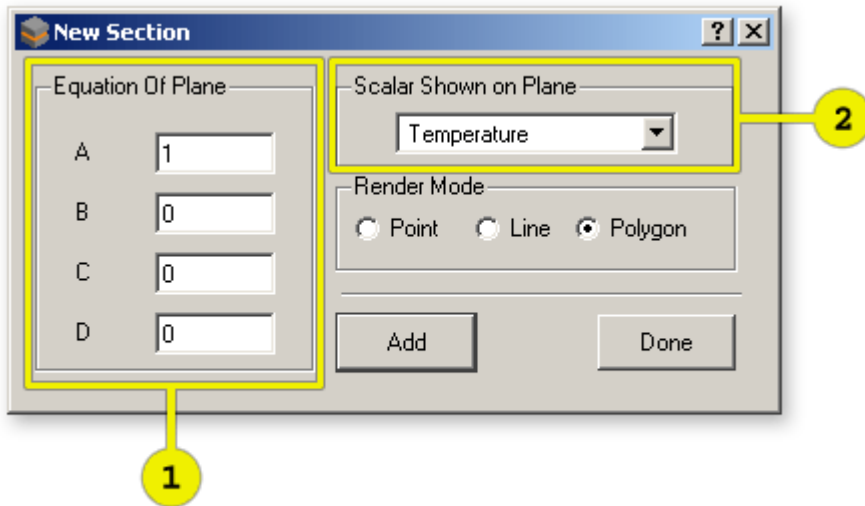
2.8 SECTION PLANE

The Section Plane plot allows us to define arbitrary planes and visualize values that have been sampled on the plane. Section planes may be added via the Section Plane command in the plots menu. This command brings up the *New Section* panel where the coefficients of the plane equation may be specified along with the scalar that the section must be coloured by. Click *OK* to add the section plane. Its entry will be added to the plots list. To further modify its parameters,

the *Section Options* panel may be brought up by double-clicking the corresponding section plane entry in the plots list.

Specifying the plane

ViewZ requires the section plane to be specified by the coefficients of the plane equation. These are to be entered in the A, B and C fields on the panel. A parameter D specifies the amount by which the plane should be translated along its normal. These coefficients may also be modified from the properties panel for the plane.



1. Specify plane equation coefficients
2. Select the scalar by which the section must be coloured by

Figure 2.3 – New Section panel

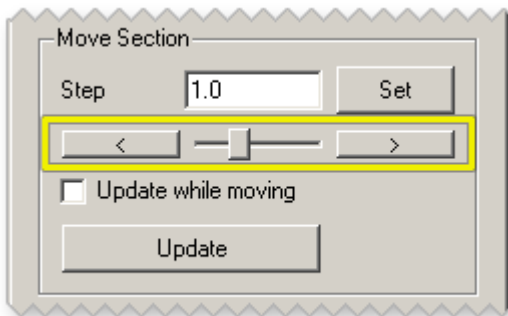


Figure 2.4 – Move Section

To move the plane along the normal, the slider in the Move Section area (figure 2.4) in the section properties panel may also be used.

2.8.1 VECTORS AND ISO-LINES ON A SECTION PLANE

The *Plot on Section* area in the section properties panel can enable visualisation of iso-lines or vectors in the section. By default a colour plot is shown on the section. To see either vectors or iso-lines on the section select the appropriate radio button. The *Options* button allows additional parameters for iso-lines or vectors to be modified. Clicking options for iso-lines brings up a dialog box where the number of levels may be specified. For

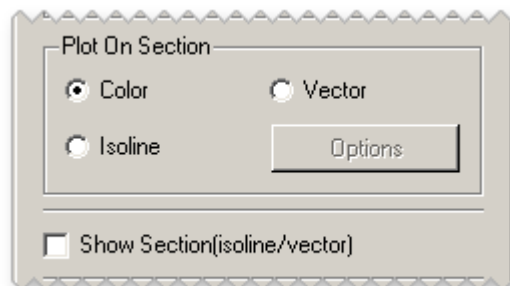


Figure 2.5 – Plot on Section

vectors the *Options* button brings up the vector properties panel which is explained in §2.9.

The *Show Section* checkbox may be used to show or hide the actual section while plots over it remain visible. Un-checking this hides the section.

2.9 VECTORS

To visualise vectors add a vector plot to the dataset by invoking the *Vectors* command from the plots menu. This command brings up the *Vector Plot Properties* panel where the various parameters for the plot may be specified.

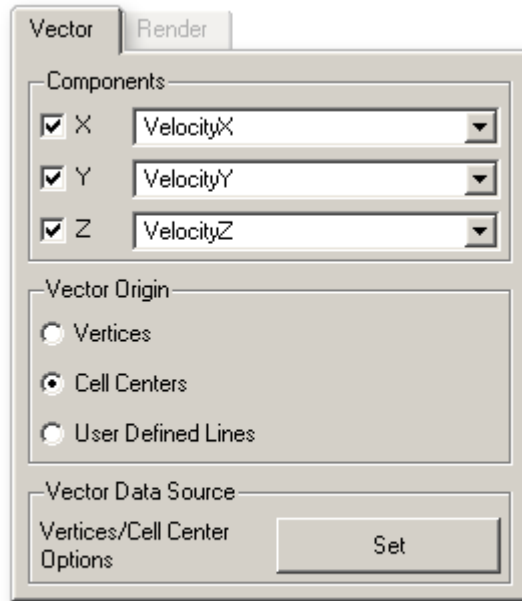


Figure 2.6 – Vector tab

In the *Vector* tab

Components - Specify the three components for the vectors here. **Vector Origin** - Specify the point from where the field values are to be taken for computing the vectors. If set to *Vertices*, field values at vertices will be used. Similarly when set to *Cell Centres*, field values at cell centres will be used. It is possible to visualise vectors at points in generated datasets. To do this set vector origin setting to the third option of *User defined lines*. A generated dataset must be present before doing this. Click on the *Set* button in the *Vector Data Source* area to select from the available generated datasets.

In the *Render* tab

Vector Length

Allows control of the length of the vector glyphs rendered.

Available settings:

- Adapt to cell size - Glyphs are sized according to cell size
- Fixed Max. - Maximum magnitude is fixed
- User defined - The vector length can be defined

Vector Colouring

- Proportional to magnitude - Colours are assigned depending on vector magnitude
- Constant colour - All glyphs are coloured by one specified colour.

Clicking the *Advanced* button will bring up the *Additional Vector Properties* panel. The parameters on this panel are:

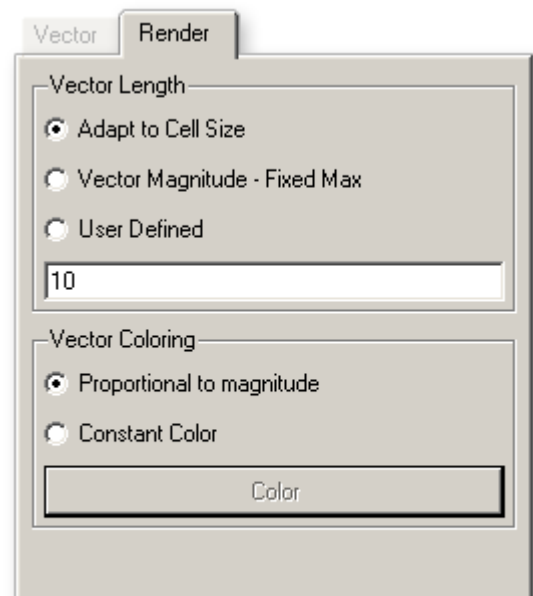


Figure 2.7 – Render tab

In the *filters* tab

Show Vectors - Specify a threshold value in the provided field that's inside the displayed minimum and maximum range and select one of the radio buttons to see only those vectors that are either above, below or equal to the set threshold value.

When viewing vectors on a section the *Vector on Section Options* area will be enabled and it is possible to set the glyphs to be projected onto the section. Use the *Show Projection on Section* checkbox to enable this. When this checkbox is checked, the projections of the glyphs on the section are rendered.

In the *Advanced Rendering* tab

Vector Length Ratio

The min. to max. vector length ratio may be fixed by setting an appropriate value here.

Vector rendering

Controls how the glyphs are drawn

Available settings:

- Cone with stem - Glyphs are drawn as a cone on a cylinder
- Cone without stem - Glyphs are drawn as cones
- Arrow - Glyphs are drawn as line arrows. This option offers the best performance.

Vector Base Radius

When vector rendering is set to something other than *Arrow*, this area is enabled and the base radius of the cone and stem may be controlled using these settings.

Available settings are:

- Vary by cell size - Glyph radius is automatically sized in proportion to the cell size.
- Percent of vector length - Glyph radius is computed as a fraction of its length. The fraction may be specified in the provided field.

2.10 ISO-LINES

Available for 2-D datasets, iso-lines are lines that connect points of equal value on a surface. Invoking the *Iso-lines* command from the plots menu will bring up the *Iso-line Options* panel where the scalar and the number of iso-lines to be drawn can be specified. There is also a range control where it is possible to specify a smaller range within the field minimum and maximum for the iso-lines. The lines are by default set to be coloured by the selected scalar itself and may be set to a constant colour. Iso-lines are best viewed over a colour plot of the same scalar.

2.11 ISO -SURFACES

Available only for 3-D datasets, an iso-surface represents points of a constant value within the given volume data. To add an iso-surface plot, select the *Iso-surfaces* command from the plots menu. This will bring up the *New Iso-surface* panel where desired scalar field and the iso-value in that field for the new iso-surface may be specified. This panel also displays the minimum and maximum values in the field. On clicking *OK* the new surface will be computed and rendered. In case no such surface is found, nothing new will be rendered on screen.

Further parameters for the iso-surface may be modified from its properties panel which can be brought up by double-clicking on the plot's entry in the plots list (§1.4.2). In addition to modifying the field and iso-value the properties panel also allows changing the scalar by which the surface is coloured. This way the variations of other scalars may be visualised on an iso-surface.

2.12 STREAMLINES

ViewZ supports visualising streamlines for 3-D datasets. To add streamlines to a dataset, click on the *Streamlines* command in the plots menu. This command will bring up the streamlines panel where parameters for rendering can be specified.

Seed positioning

Seed points for the streamlines can be arranged as a grid or in a circular or elliptical manner. In each case a reference point has to be specified about which the rest of the points are created. To specify the reference point either enter its coordinates into the fields or use the nudge scrollbars to position the point at the desired location. The three smaller sliders may be used to rotate the array of points as desired.

In the *Parameters* section, the *Seed Dispenser Type* drop-down list allows one to select the arrangement of points desired. For each type of arrangement, parameters fields specific to it will be shown. When *Grid* arrangement is selected, the number of points in three directions and the distance between consecutive points may be specified.

For circular and elliptical arrangements, the reference point acts as the centre and the seed points are drawn around it. For both these arrangements the following parameters may be set:

- *Number of points* to be created. The points are placed along the circumference.
- *Start and End Angles*, for creating points only along a section of the circumference in degrees.
- *Radius* of the circle. In case of an ellipse, the *semi-major* and *semi-minor* axes are to be specified.
- *Number of Disks* specifies the number of such circular or elliptical disks to be created.

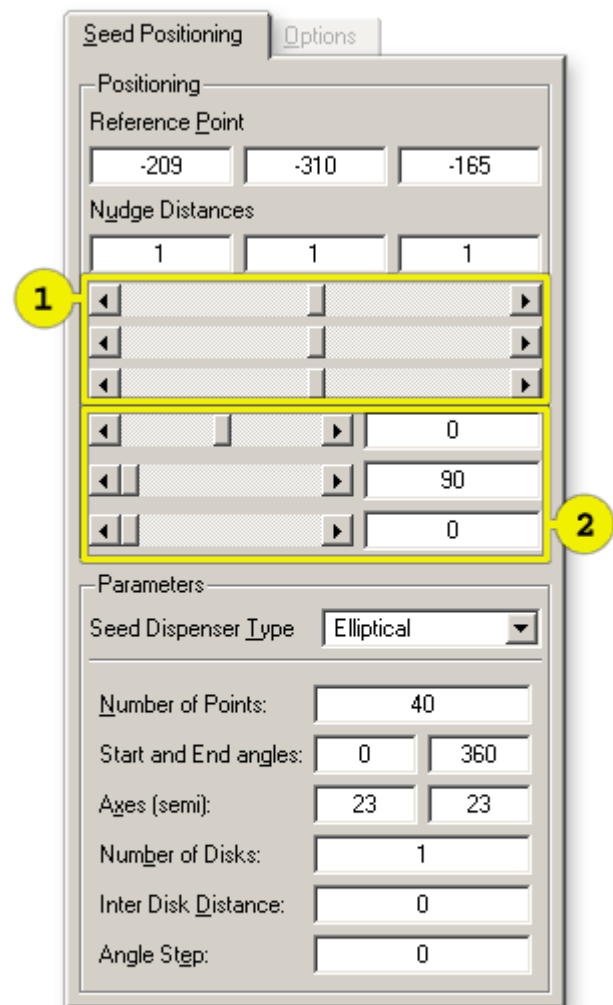


Figure 2.8 – Seed positioning for streamlines

1. Nudge-bars, use these to position the reference point.
2. Use these controls to orient the array of points.

- *Inter Disk Distance* is the distance between each disk of points in case there's more than one.
- *Angle Step* in degrees is added to the start and end angles for each consecutive disk of points created.

On clicking *Apply*, the streamlines will be drawn if any of the start points lie in a region that has velocity components. If there are no velocity components near the point then just the point will be seen without any streamline. Keeping the auto update checkbox checked will cause streamlines to be redrawn every time its seed points are moved.



Figure 2.9 – Auto update

When available, the *Options* tab provides two more parameters that can be adjusted. One is the *Step Size* parameter which is the amount of time for which the streamline should advance per step. This parameter may be adjusted to get smoother streamlines. The other parameter is *Time steps* which is the number of such advances the streamline will

make.

2.13 SURFACE STREAMLINES

Streamlines showing the flow very close to the surface can be seen using surface streamlines. To plot these lines, invoke the Surface Streamlines command from the Plots menu. This will bring up the panel that allows one to select from a list of labels and boundaries in the dataset, on which to draw these lines. Once the desired surfaces are selected, click *OK* to see the lines.

Double-clicking on the *plots list* (§1.4.2) entry for surface streamlines will bring up its properties panel where further options to modify the plot are available. The surface streamlines plot is currently available only for 3-D unstructured datasets.

2.14 X-Y PLOTS

These are 2-D graph plots that can be plotted for point's generated using the *Line Probe* (§3.4) command. To add an X-Y plot, the data for which plots are needed must be imported using the *Import Data for Graph* (§3.1) command in the file menu. Once the plot is added, the rendering canvas will display a preliminary graph and the *X-Y Plot Properties* panel will also be visible.

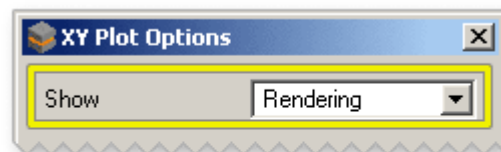


Figure 2.10 – Switch sections using the drop-down list.

The *X-Y plot Properties* panel has four sections that may be selected using the drop-down list at the very top.

Rendering

In the *Rendering* section, options for setting properties about how the plot lines and the legend are to be rendered are available. It is possible to render the plot as lines, points or filled area.

Options are also available to modify the way the lines, points or filled area is drawn. The position of the legend can set to top left, top right, bottom left or bottom right.

Variables

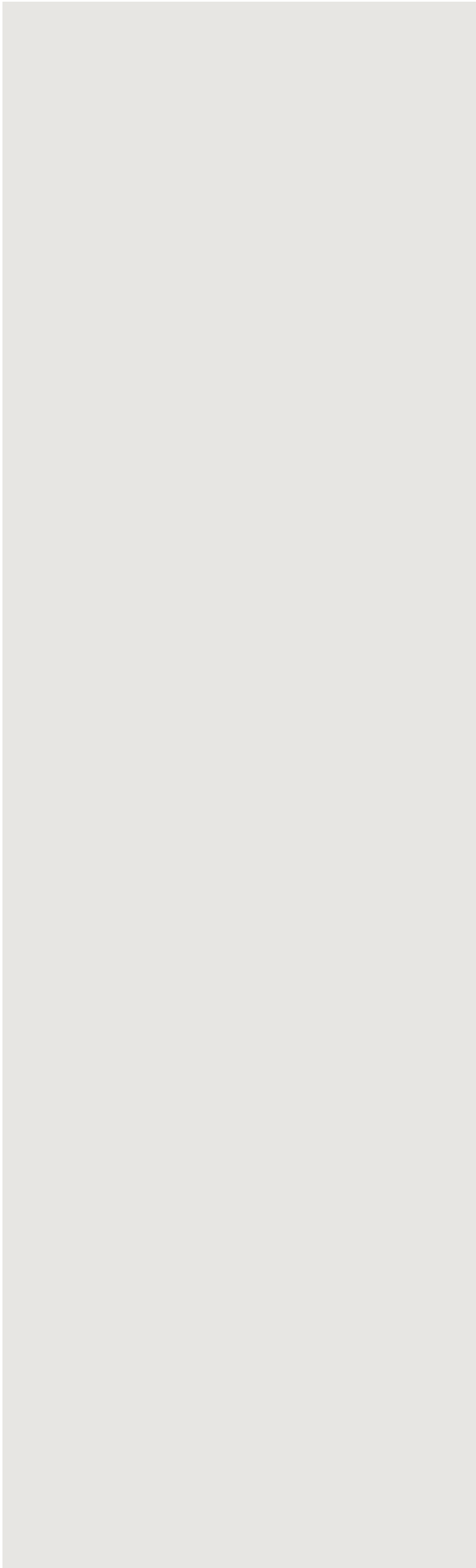
A list of variables for which data is available is shown in this section. From here it is possible to control which variables are plotted, rename them in the legend and change their plot colour. It is also possible to change the independent variable for the plot.

Position and size

Settings available in this section allow the plot area to be resized as needed and repositioned anywhere within the rendering canvas. Two sliders are available that allow the plot area to be resized. Clicking on the *Move using Mouse* button will temporarily hide the panel and allow repositioning the plot area within the rendering canvas. When doing this, an empty rectangle represents the complete area of the plot. Position this rectangle at the desired location and click with the LMB on the rendering canvas to set the x-y plot at that location. After clicking, the properties panel will reappear.

Common

This section has some additional options for controlling how the plots are shown. The foreground and background colours for the plots can be set here among other options.



CHAPTER III

TOOLS AND SETTINGS

3.1 IMPORTING DATA FOR GRAPHS

In order to plot graphs (see X-Y plots, §2.14) the data to be plotted needs to be imported into ViewZ. This may be done using the *Import Data for Graph* command in the file menu. Clicking this command brings up a panel which allows one to browse and select the data file from disk. If the data file is a ViewZ generated file then the *File Type* drop-down list must be set to *ViewZ tabular data*. ViewZ also supports plain tabulated data stored in a text file. These are files with multiple rows of data with each row having tab separated data. When opening such files, set the *file type* drop down to *Pure tabulated data* and specify the number of rows and columns of data in the file.

The dependent and independent variables may be set in this panel itself. This may also be modified later. Click open to import the data file and add the X-Y plot to the plots list. The plot will also be rendered on screen immediately.

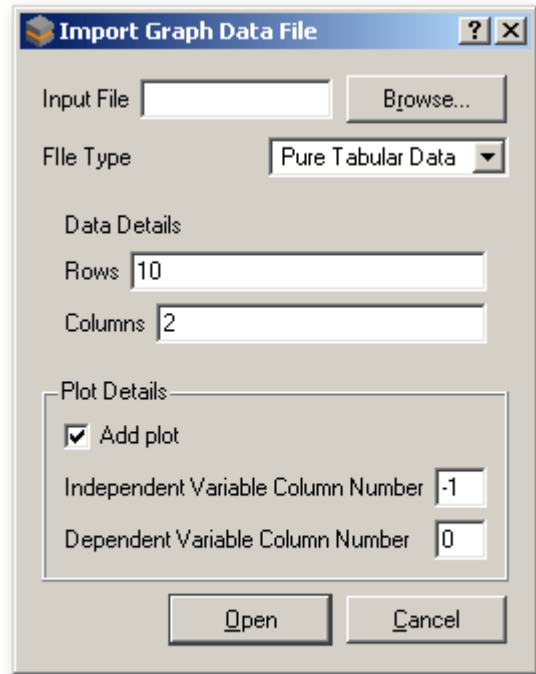


Figure 3.1 – Extract Dataset Panel

3.2 DATASET TOOLS

The Dataset menu contains tools that work on loaded datasets.

3.2.1 EXTRACT DATASET

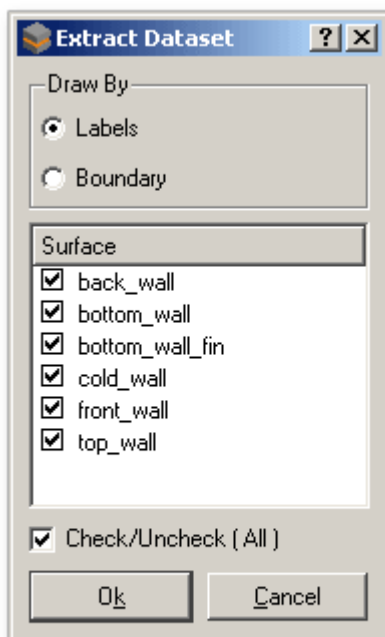


Figure 3.2 – Extract Dataset Panel

This tool allows one to create new datasets from parts of a loaded dataset. Specifically, one may create surface datasets by extracting labels or boundaries a 3-D dataset. Invoking the *Extract Dataset* command in the *Dataset* menu brings up the corresponding panel which lists all labels and boundaries in the currently loaded dataset. To extract a label or a boundary, check-mark it in the list and click the *OK* button. A new surface dataset is then created and added to the *datasets list* (§1.4.1).

3.3 USER PREFERENCES

The Preferences panel in which may be invoked by clicking on the *Preferences...* command in the *Edit* menu has three tabs. The General tab has settings for:

The default projection mode

ViewZ will remember this as the default projection mode and all rendering will be done in this mode unless changed using the view menu command for switching projection modes.

Canvas background colour

The canvas background colour may be changed by clicking the *Set Canvas Background* button which brings up a colour picker dialog box.

Default mesh opacity

The default opacity of the main mesh plot (§2.3) may be set using this slider.

Help browser

The HTML help pages need an appropriate browser which should be specified here. This field must contain the full path to the browser executable. If the browser location is specified on the system *path* variable then putting just the browser executable name would suffice.

Recent Files

ViewZ can remember few of the most recently used files and displays these under the *Recent Files* entry in the *File* menu. The number of files to remember may be set here. Clicking on the *Clear* button will clear this list. To turn off this feature, set the number to remember to 0.

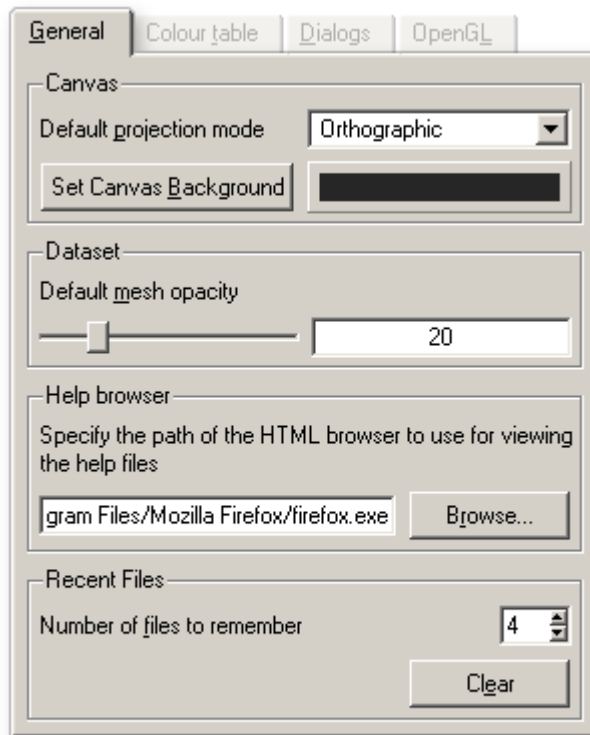


Figure 3.3 – General properties

The *Colour table* tab in the preferences dialog allows customisation of the colour map used by the plots. The following options are available:

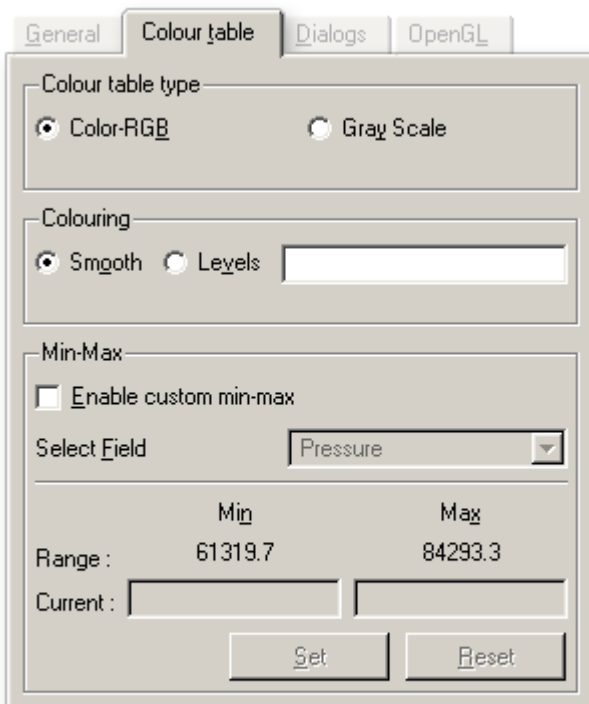


Figure 3.4 – Colour table properties

Colour table type

Set the colour map to either gray scale or to show multiple hues.

Colouring

This may be either smooth or banded. If banding is desired, set the levels or number of colours to use. A minimum of 8 levels must be specified.

Custom Min-Max

By checking the *Enable custom min-max* check box, it is possible specify a custom range for the scalar field values. All plots that are coloured by such a scalar will be displayed with colour variations only for the set range. For values outside of the set range, the extreme end colour is used.

The *Dialogs* tab has settings that allow

one to configure the behaviour of certain dialog boxes and panels in ViewZ. The *Confirm before closing* checkbox may be unchecked to disable the confirmation message box that appears each time some dataset has to be unloaded from ViewZ.

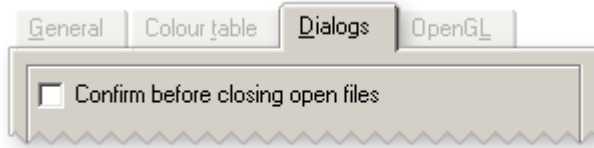


Figure 3.5 – Confirm Close check box

The last tab on the preferences panel is *OpenGL* and it lists some basic information about the graphics subsystem and OpenGL extensions supported.

3.4 LINE PROBE

Available for 3-D structured datasets, this tool allows extracting points from a dataset with associated field values at those points as a smaller generated dataset for visualisation. In the current version, ViewZ supports displaying vector glyphs (§2.9) on such generated datasets.

The line probe tool extracts points on a straight line specified using the *Line Probe* panel available from the *Data Probe* menu. The probe can insert points along the line terminating at boundaries or between the start point and a boundary. This is controlled by the *Point insertion mode* radio buttons (figure 3.6). If the

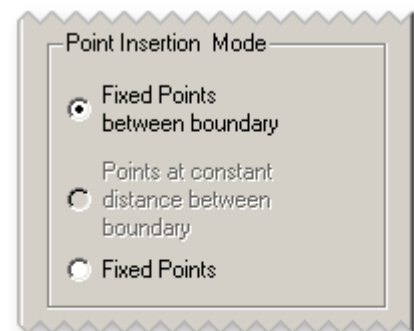


Figure 3.6 – Point insertion mode

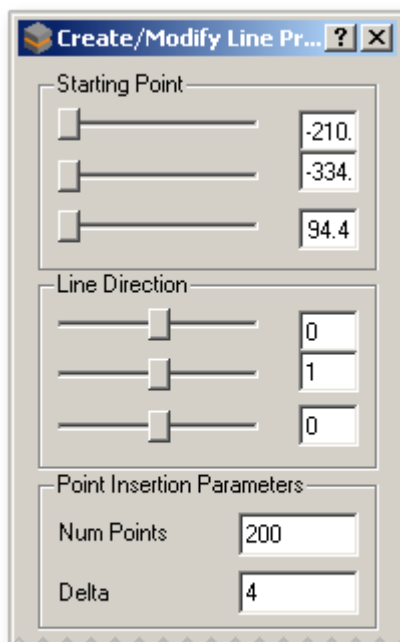


Figure 3.7 – Specifying Line

Fixed points between boundaries radio button is selected the points are inserted along the line terminating at boundaries. If the *Fixed Points* radio button is selected, the points are inserted between the start point and a boundary.

Once the line is specified and the point insertion parameters specified, click the *Add/Modify* button to find the points. A message box will provide information about the number of points inserted. At this point a new entry will be added to the *datasets list* (§1.4.1) of type *Line Probe*.

3.4.1 CREATING TABULAR DATA FILE

On clicking *Done* the option to save the point data to a file as ViewZ tabular data will be available. If *Yes* is selected, the *Write Probe to File* panel appears. In this panel a save file path can be specified and the scalars to be written to disk may also be specified. To click the *Write* button to write the file to disk and click *Close* to close the panel.

3.5 LINE ON SURFACE PROBE

The Line on Surface Probe is similar in function to the Line probe in the previous section with the difference that the line in this case lies on a surface instead of the volume of the dataset. The panel for this probe allows one to select surfaces from among the labels and boundaries in the dataset on which to place the line. The line itself may be specified either using the mouse or by specifying a plane that intersects the surface in which case the line of intersection is used.

To use the mouse to specify the line, select the *Using Mouse* radio button in the *Probe Options* tab and click on the *Start* button. Click on two locations on the target surface to specify the start and end points of the line and then click the *Probe* button to get the points.

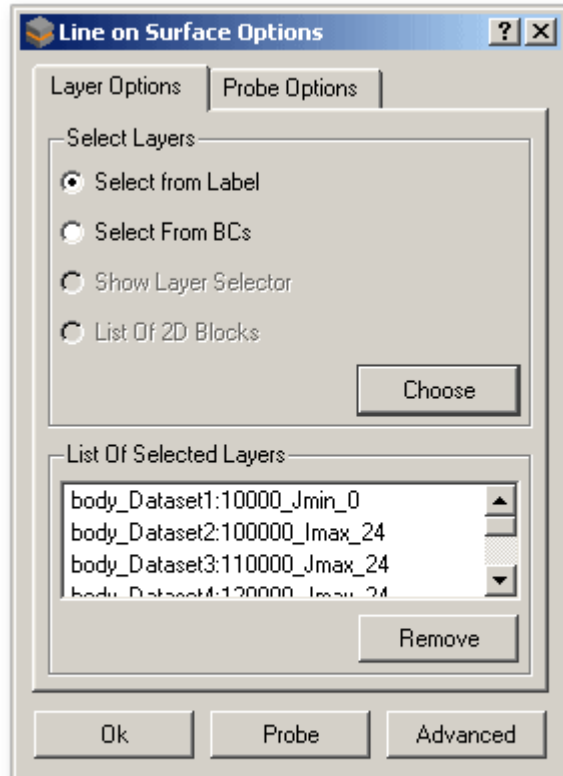


Figure 3.8 – Line on Surface panel

3.6 POINT PROBE

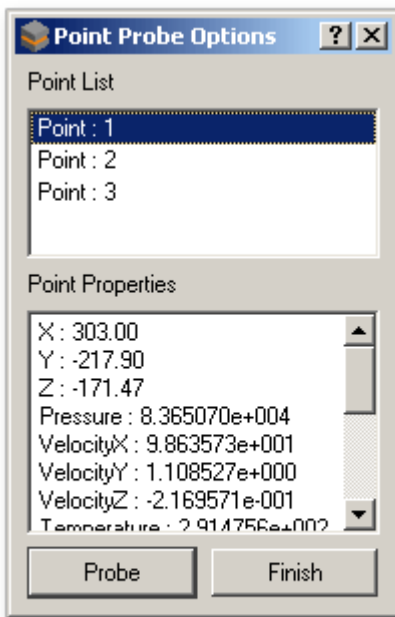


Figure 3.9 – Probed Points and data

Point Probe lets one see scalar values at specific user selected points in the dataset. This tool requires one to place a section and probe points on the section. Invoking the *Point Probe* command from the *Data Probe* menu brings up the corresponding panel. The probed points and values at those points are listed by this panel. Once the section is in place click on the *Probe* button and then double click at the required points on the section. Each time the point under the mouse is probed and it's values listed in the panel. To stop the process, note all the required values and click on the *Finish* button. This will also close the panel.