Plotting with Analysator's MayaVi interface

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Contents

1 Plotting the grid

```
import pytools as pt
f = pt.vlsvfile.VlsvReader('bulk.0000872.vlsv')
grid = pt.grid.MayaviGrid(f, 'rho')
```

2 How to navigate

In order to navigate, use the mouse scroll to zoom, mouse3 to move the image and mouse 1 to tilt the grid.

3 Picker options

Analysator has implemented many picker options. These include:

1. None
2. Velocity_space
3. Velocity_space_nearest_cellid
4. Velocity_space_iso_surface
5. Velocity_space_nearest_cellid_iso_surface
6. Pitch_angle
7. Gyrophase_angle
8. Cut_through (See Section 3.1)

3.1 Cut_through

The cut-through option requires specifying the variable to be plotted with the *Args* field in MayaVi and needs two clicks somewhere in the MayaVi plot (starting and ending point for the cut-through). The cut-through feature is best illustrated in Figures 1-4.

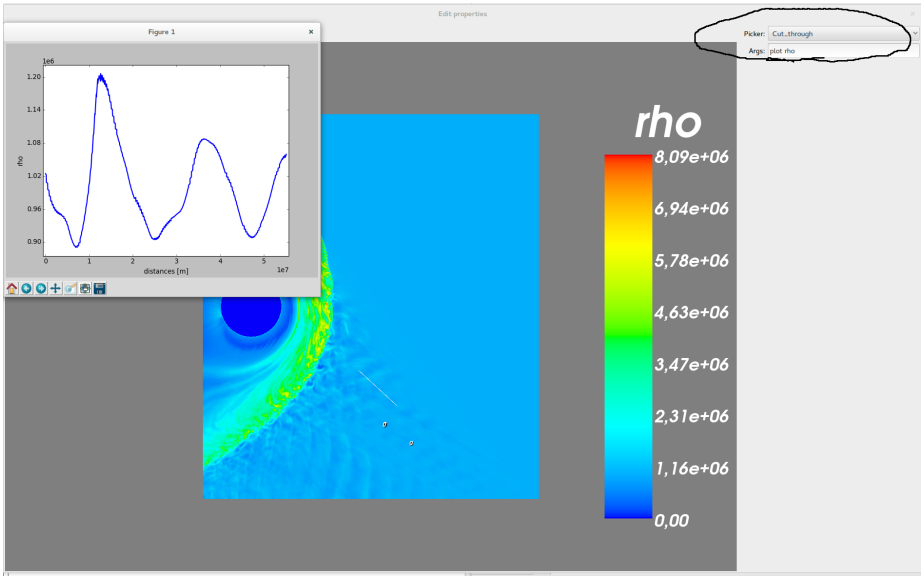

Figure 1: Example plot with the cut-through function demonstrating its use. The cut-through is drawn as a line and we are plotting the cut-through of rho, as specified in the *Args*-field seen in the picture.

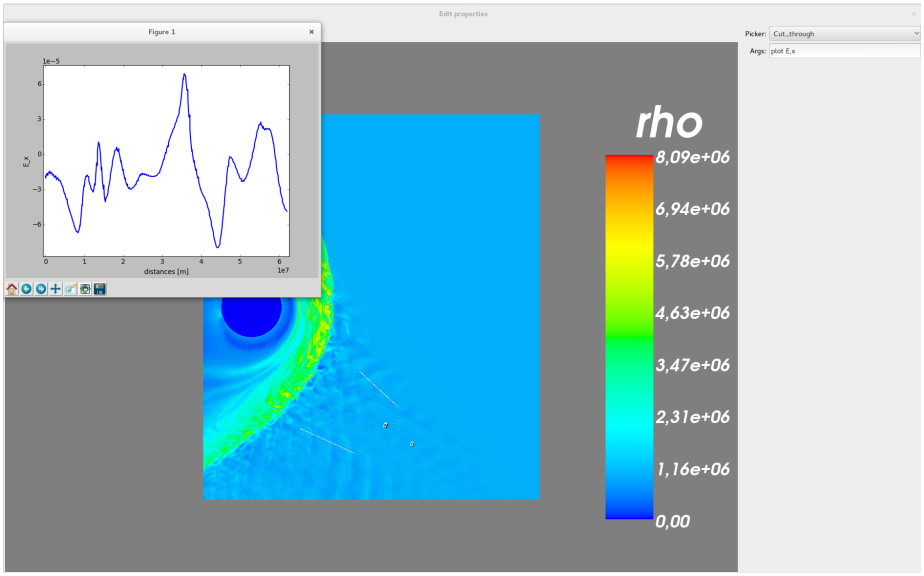

Figure 2: Example plot with the cut-through function demonstrating its use.

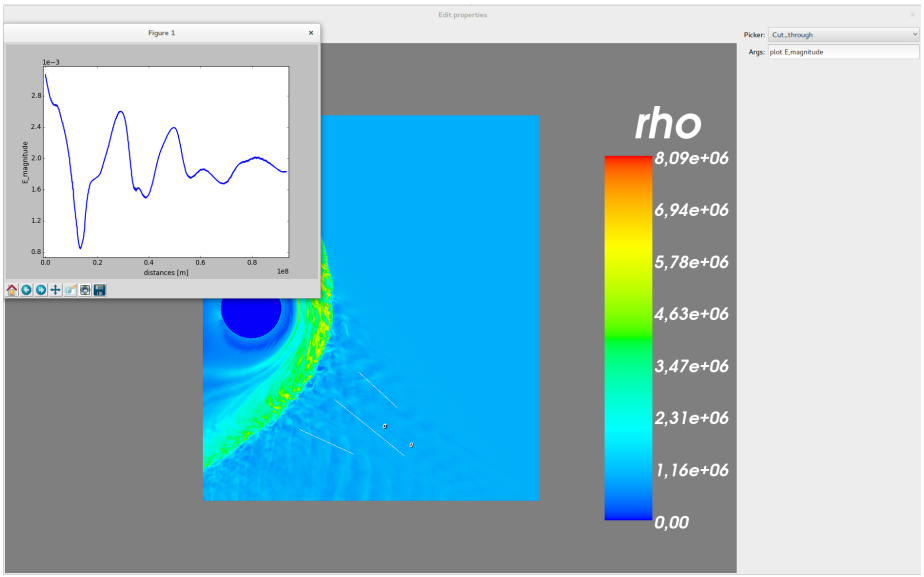

Figure 3: Example plot with the cut-through function demonstrating its use.

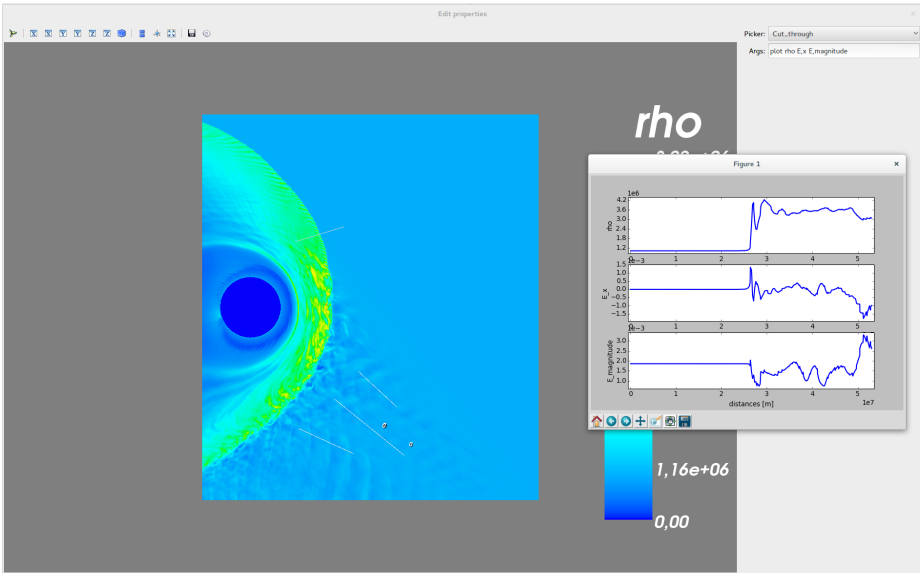

Figure 4: Example plot with the cut-through function demonstrating its use.

3.1.1 Cut-through: Example *Args* fields

Example Args fields:
Plots *rho*:

```
plot rho
```

Plots the x-component of **E**:

```
plot E,x
```

Plots the magnitude of **B**:

```
plot E,magnitude
```

3.2 Velocity_space and Velocity_space_nearest_cellid

Draws the velocity space for the cell we click on. If there exists no velocity space data in the vlsv file for the given cellid, then using *Velocity_space_nearest_cellid* is adviced, as it picks the nearest cellid with velocity distribution data and draws it.

Example is shown in Figure 5

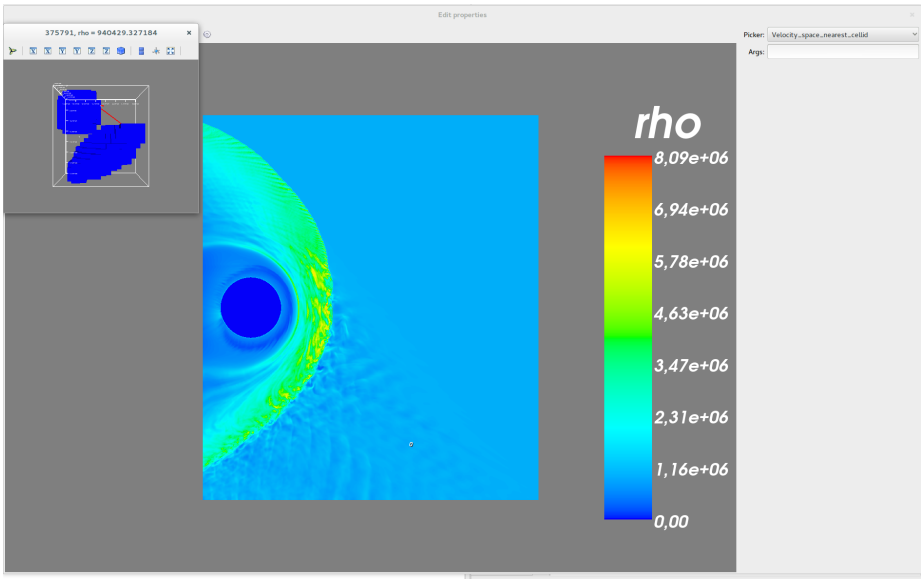

Figure 5: A velocity space drawn for a clicked cellid. The cell is marked with a *0* in the plot.

3.3 Velocity_space_iso_surface and Velocity_space_nearest_cellid_iso_surface

Same as with Velocity_space but draws an iso-surface plot.

Example is shown in Figure 6

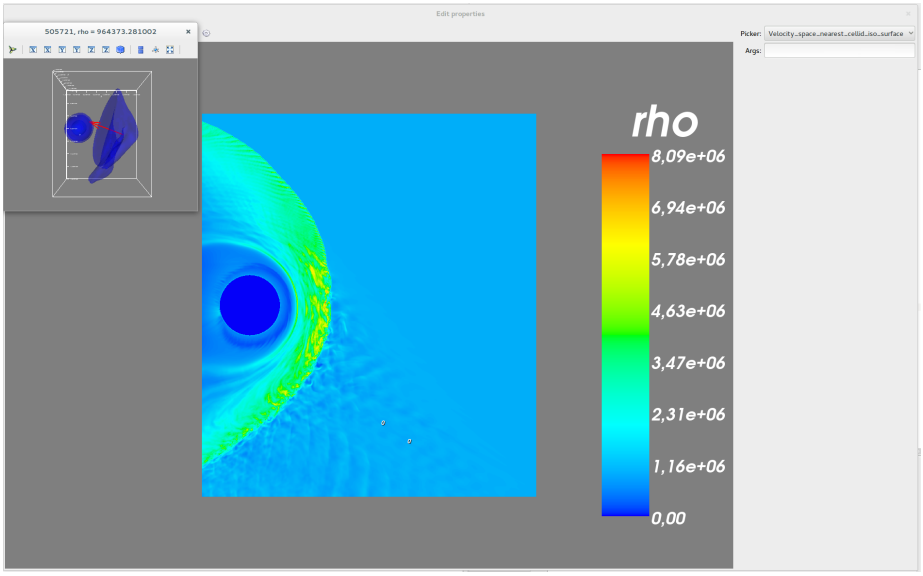

Figure 6: A velocity space drawn for a clicked cellid. The cell is marked with a *0* in the plot.

3.4 Pitch_angle

Draws a pitch angle plot for a given cell id.
Example: Figure 7

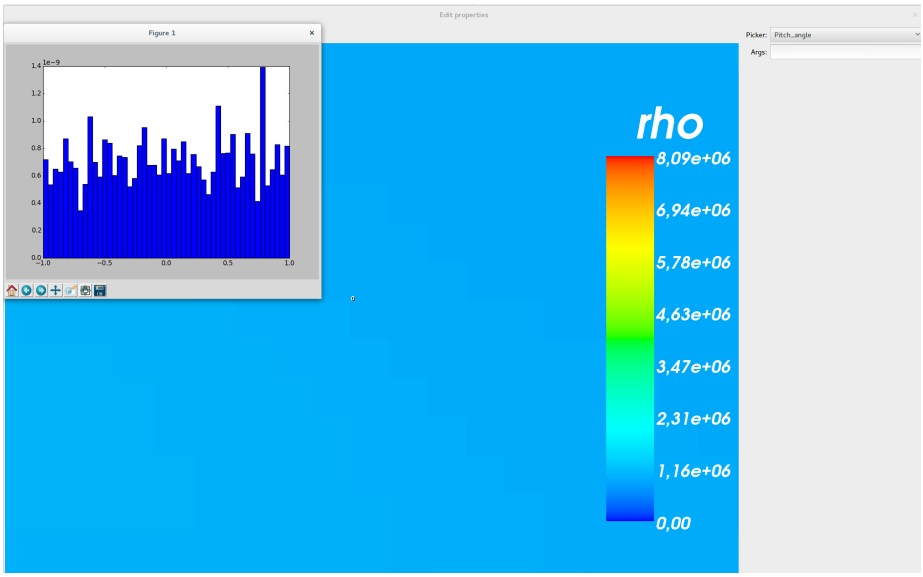

Figure 7: A pitch angle plot drawn for a clicked cellid. The cell is marked with a *0* in the plot.

3.5 Gyrophase angle

Draws a gyrophase angle plot for a given cell id. This feature was added to Analysator thanks to Yann's contribution.

Example: Figure 8

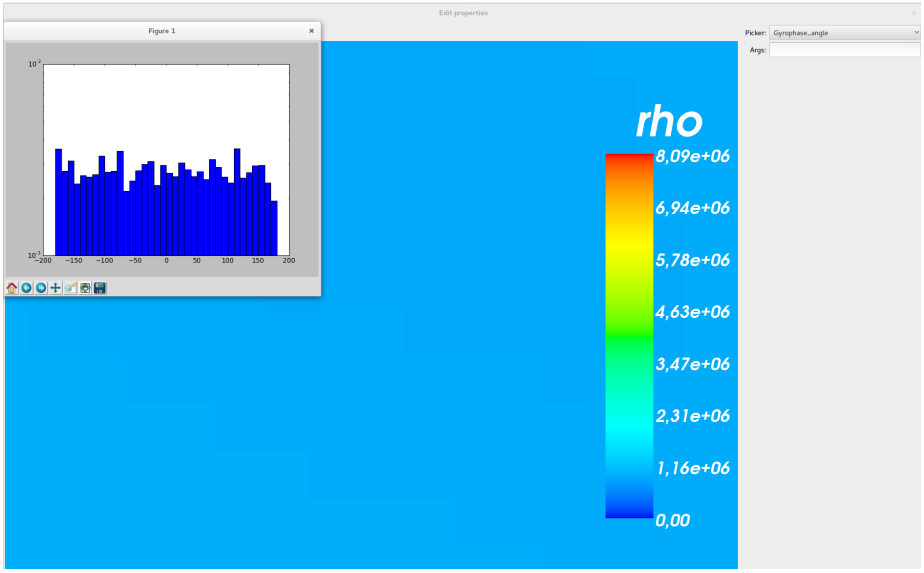

Figure 8: A gyrophase angle plot drawn for a clicked cellid. The cell is marked with a *0* in the plot.