

VisIt-tutorial-basics

From VisItusers.org

Contents

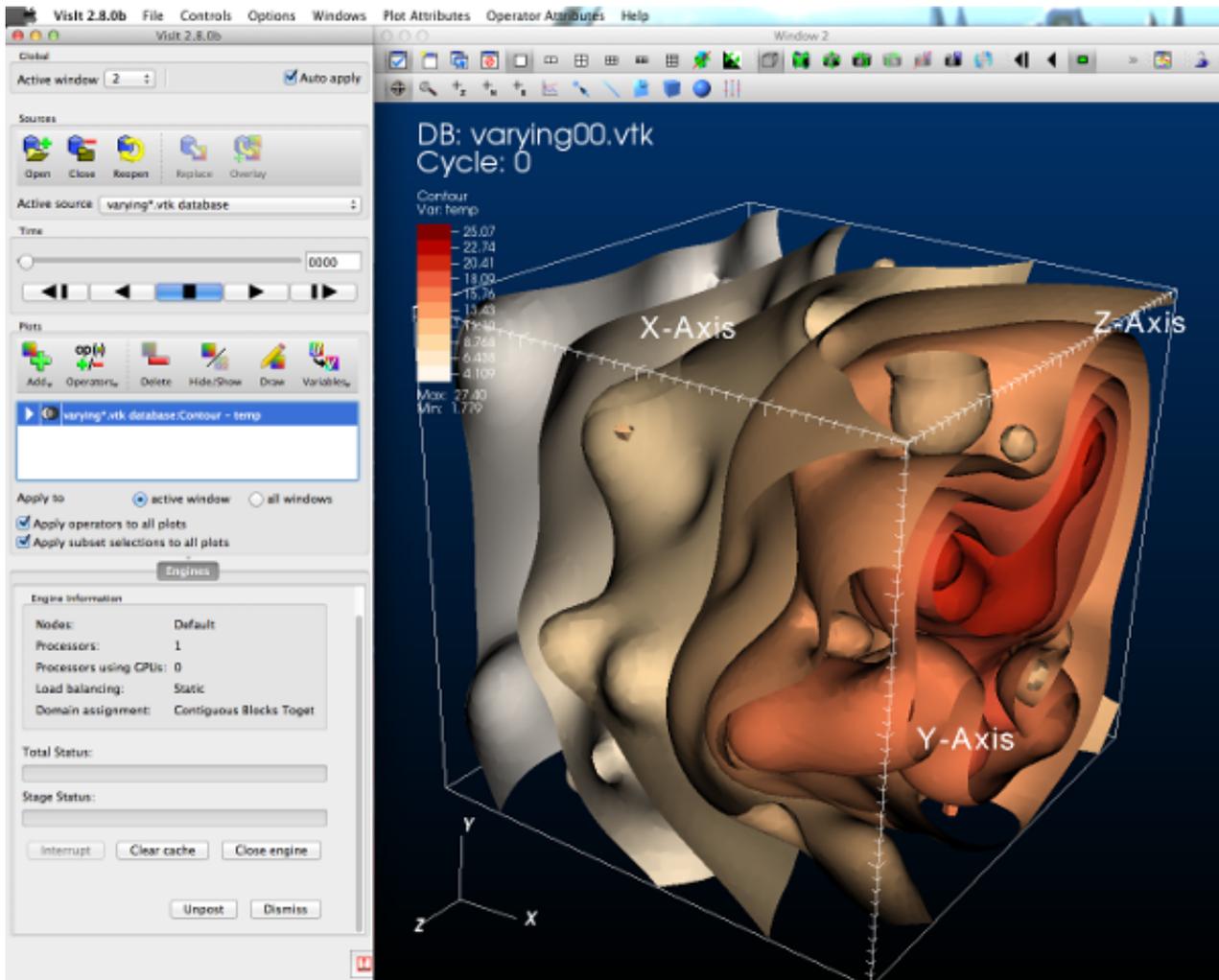
- 1 Starting VisIt
- 2 What you see
- 3 Opening files
 - 3.1 Advanced file opening features
- 4 Making a plot
- 5 Modifying the Plot attributes
- 6 Applying an operator
- 7 VisIt interaction modes
 - 7.1 Pick
- 8 Other plots
- 9 Other operators
- 10 Saving an image
- 11 Saving a database
- 12 Subsetting

Starting VisIt

The way you start VisIt depends on the platform you are on:

- On Windows, double click on the VisIt icon
- On Mac, double click on the VisIt icon where you installed it (generally in the /Applications folder).
- On Unix, invoke: */path/to/visit/bin/visit*
 - Most people ultimately put */path/to/visit/bin* in their \$PATH and then just say "visit".

What you see



- The tall grey window on the left is called the "GUI". It is the primary mechanism for driving VisIt.
- The window on the right is called the "viewer". It displays results.

Opening files

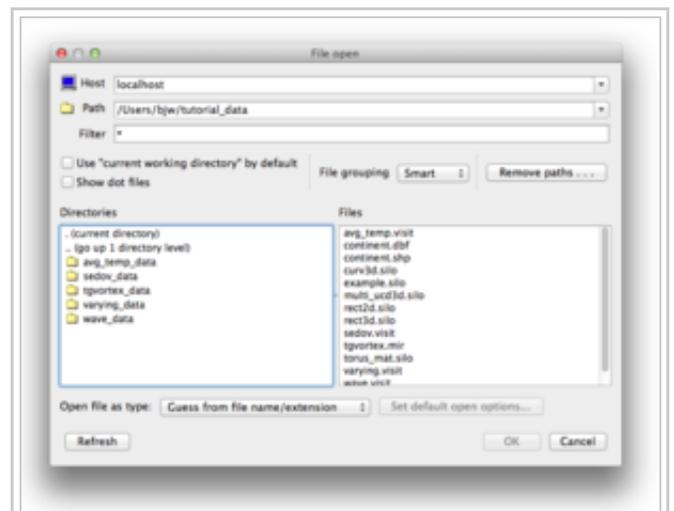
The first thing to do is to select and open files.

1. Go to the GUI and find Click on the "open file" icon..
2. Change the "Path" field to be "tutorial_data"
3. Highlight the file "example.silo" and then click "OK"

You've opened a file!

Advanced file opening features

1. In the file selection window:
 - There is a field for "host". That is how you run client/server

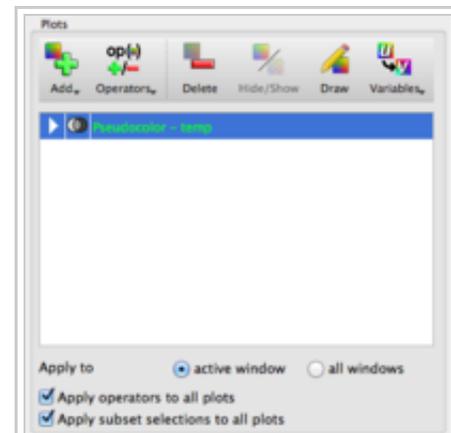


Open File Dialog

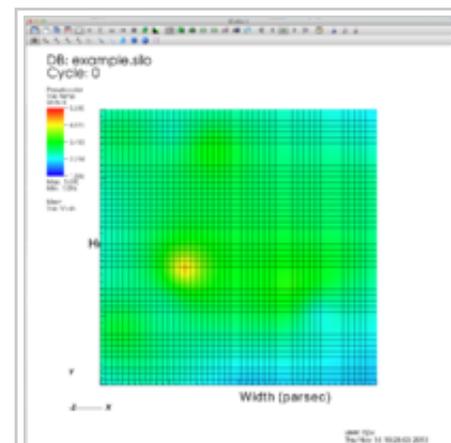
- There is a "filter". That is provided to subset the file list to only the files VisIt may want.
 - Example filter: "*.silo *.vtk"
- 2. Another mechanism for opening files is under File->Open. It opens a single file.
 - This allows you to explicitly tell VisIt what type of file it is opening.
 - VisIt uses heuristics otherwise (which are often successful).
- 3. You can also open files on the command line: "visit -o file.ext"

Making a plot

1. Click on the Add button to access various plots. This is located about half way down in the Main window.
2. Select *Pseudocolor->temp* to add a Pseudocolor plot.
3. After adding a plot, you will see a green entry added to the "Plot list", which is located half way down the gui.
 - This means VisIt will draw this plot after you click "Draw"
4. Click Draw.
5. You should see a plot appear in the visualization window.
6. Go to *Plots->Mesh->Mesh*
7. Click draw.
8. You should now see both a Pseudocolor and plot mesh.
9. Highlight the Pseudocolor plot in the active plots list.
10. Click the *Hide/Show* button
 - (This will hide the Pseudocolor plot ... you should now see only the mesh plot.)
11. Highlight the Mesh plot and click *Delete*.
 - You should now have an empty vis window.
 - The Pseudocolor plot should now be selected.
12. Click *Hide/Show*
 - The Pseudocolor plot should reappear.



A pseudocolor plot of "temp" ready to be drawn.

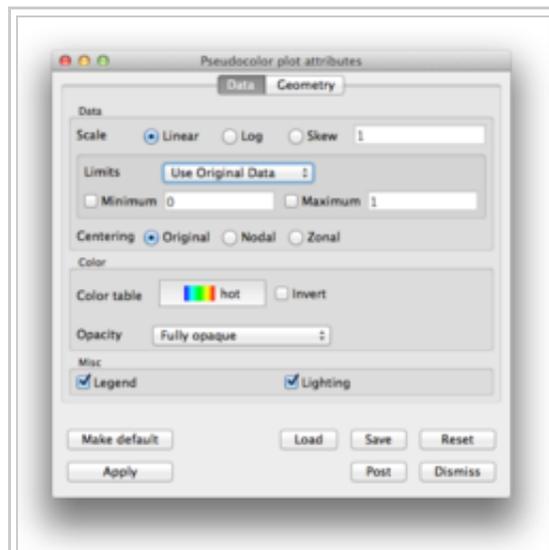


The pseudocolor and mesh plots drawn in the vis window.

Modifying the Plot attributes

1. Go to Plot Attributes->Pseudocolor.
 - This should bring up a window for modifying the plot.
2. Change the scale from "Linear" to "Log"
3. Click Apply.

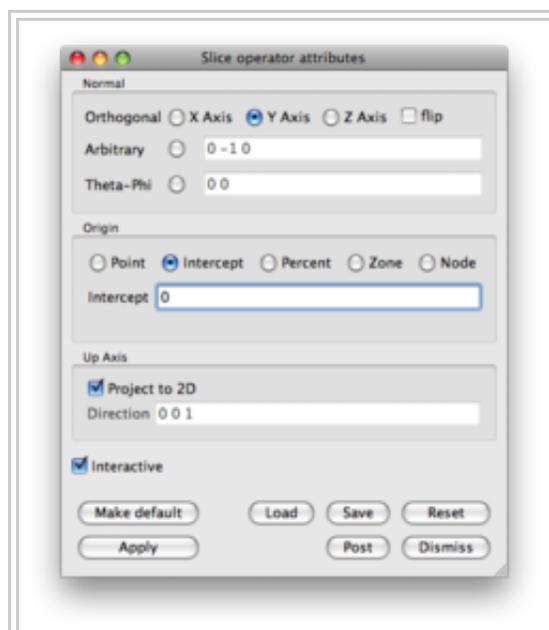
- (The colors changed)
4. Click "Min" on and change the min to 3.
 5. Click "Max" on and change the max to 4.
 6. Click Apply.
 - (The colors change again.)
 7. Change the *Opacity* mode to "Constant"
 - Change the opacity slider to 50%.
 8. Click Apply.
 - (You can now see through the plot. Note that you only see the external faces. If you want to see the data from the whole volume, that will be with the volume plot.)
 9. Change back the scale, limits, and opacity back to their original settings and click Apply.
 10. Dismiss the Pseudocolor plots window.



Pseudocolor Plot Attributes window

Applying an operator

1. Go to Operators->Slicing->Slice
 - Operators is located next to Plots.
2. Click "Draw".
3. You are now looking at a 2D slice.
4. Go to Operator Attributes->Slicing->Slice.
5. There are many controls for setting the slice plane ... play with them.
6. Operators can be removed by clicking on an expansion arrow in the plots list, then clicking on the red X icon next to an operator.



Slice Operator Attributes window

VisIt interaction modes

There are six basic interaction modes:

1. Navigate



2. Zoom 
3. Zone-pick 
4. Node-pick 
5. Spreadsheet-pick 
6. Lineout 

You always start in Navigate. Navigate allows you to pan and rotate the data set.

1. Put the cursor in the visualization window from the viewer.
2. Left click (or single click if you do not have a 3 button mouse) and move the mouse.
3. The data set will pan with the mouse.
 - In 3D, the data set rotates.

1. The interaction mode is controlled by the toolbar, which is located at the top of the visualization window.
2. The five interaction modes are all located together on the toolbar, towards the bottom.

- Navigate is represented by a compass  and should be indented.

3. Click on the magnifying glass , which corresponds to zoom.
4. Go to the visualization window and left click (single click) and HOLD IT DOWN.
5. Move the mouse a bit.
 - You should see a rubber band.
6. Lift up the mouse button.
 - You should now be zoomed in so that the viewport matches what was previously inside the rubber band.

1. Find the icon of a camera that has a green "X" around it. (The camera is mostly obscured by the X)



2. Click it.
 - This will reset your view.

3. Click the icon next to the magnifying glass, which has red, blue, and black lines. 
 - This is for lineout.

4. Put the cursor over the data and left click (single click) and HOLD IT DOWN.
5. Move the mouse a bit.
 - You should see a single line moving around.

6. Lift up the mouse button.
7. The window layout changes. You now have two windows. The first window is the same, but the

second now contains a "Lineout", which has temp as a function of distance over the line.

- On the window that has the curve, find the icon on the toolbar of the window with a red circle with a



line through it.

- Click this button.
 - The new window should disappear.

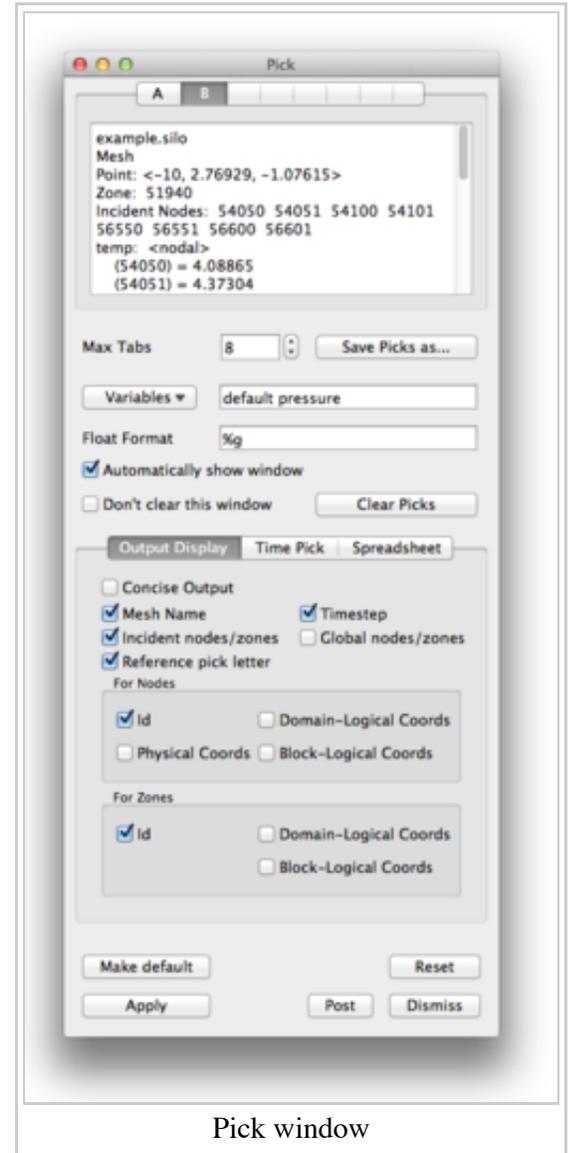
Pick

You should only have one window now.

- Click on the icon that has a '+' with a small Z.  This is "zone-pick".
- Put the cursor over the data set and left click (single click).
- This will bring up a new window ... the *Pick window*.
 - The pick window contains information about the zone (i.e. cell or element) that you just picked in.
- The pick contains variable information, intersection location, zone ID, and IDs of incident nodes (i.e. point or vertex).

Pick can return a lot more information than it did if you use the Pick window.

- Go to the Variables drop down and select "Scalars\pressure"
- Turn on "Physical Coords" under "Display for Nodes"
- Turn on "Domain-Logical" under "Display for Zones"
- Click apply.
- Make another pick.
- You get info about pressure, the coordinates of each node, and the logical coordinates for the zone.



Pick window

Other plots

- We will experiment with the Contour, Filled Boundary, Label, Vector and Volume plots.

Other operators

1. We will experiment with the Clip and Threshold operators.

Saving an image

1. With a current plot, go to File->Save Window.
 - This saves an image to the filesystem.

On windows, the default location for saved images is in *Documents/VisIt/My images*.

Saving a database

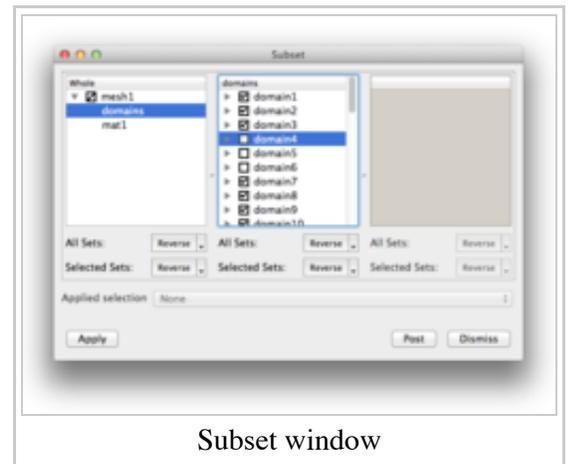
VisIt can be part of a larger tool chain.

1. If you do not already have one, make a Pseudocolor plot of temp from the example.silo database.
2. Apply the Threshold operator and change the range to be 3->max.
3. Draw.
4. Go to File->Export Database.
5. Change the file type to VTK.
6. Be sure to set the output directory or the exported file will be written to the working directory (*on Windows that would be the directory where VisIt is installed*).
7. Export.
 - A file named `visit_ex_db.vtk` has been saved to the file system.



Subsetting

1. Delete any plots in your window.
2. Open up multi_ucd3d.silo
3. Make a Subset plot of "domains(mesh1)"
 - The plot is colored by "domains", which normally correspond to a simulation's processors.
4. In the active plots list, find the overlapping transparent black and white ovals (like a Venn diagram) and click on it.
5. This will bring up the Subset window.
6. Turn off some domains and click apply
 - You will see some of the domains disappear.
 - (Subsetting works with any plot type.)
7. Turn all the domains back on.
8. Turn off materials 1 and 3.
 - You will see material 2 only, colored by domain.



This mechanism is used to expose subsetting for materials, domains, AMR levels, and other custom

subsettable parts.

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Category: VisIt Tutorial

- This page was last modified 22:12, 14 November 2013.