



Visit

- Open Source, parallel visualization from LLNL
- Scalars, tensors, vectors
- Support for AMR and CSG meshes
- Quantitative analyses (expressions, queries, picking, lineout)
- GIS support
- Annotation for publication and presentations
- Built on VTK



Visit Advanced Features

- Geometry export to Curve, Alias Wavefront...
- Animation and movie generation
- Scripting interface with Python
- API interface with C++ and Java
- Dynamically extensible through plugins
- Parallel and distributed for large datasets
- Multiple database correlation / visualization



Visit on Spur

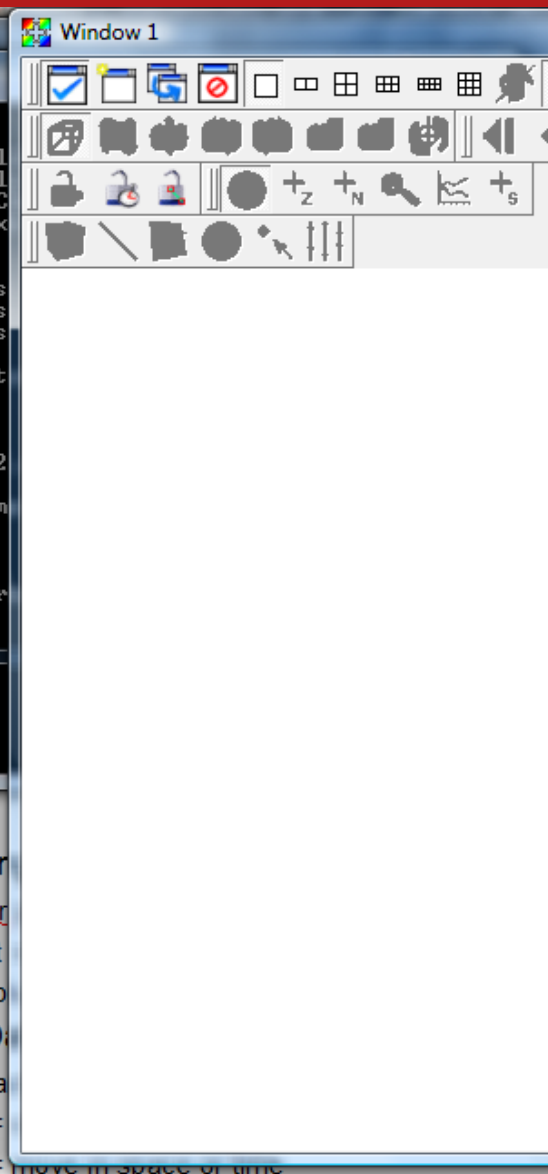
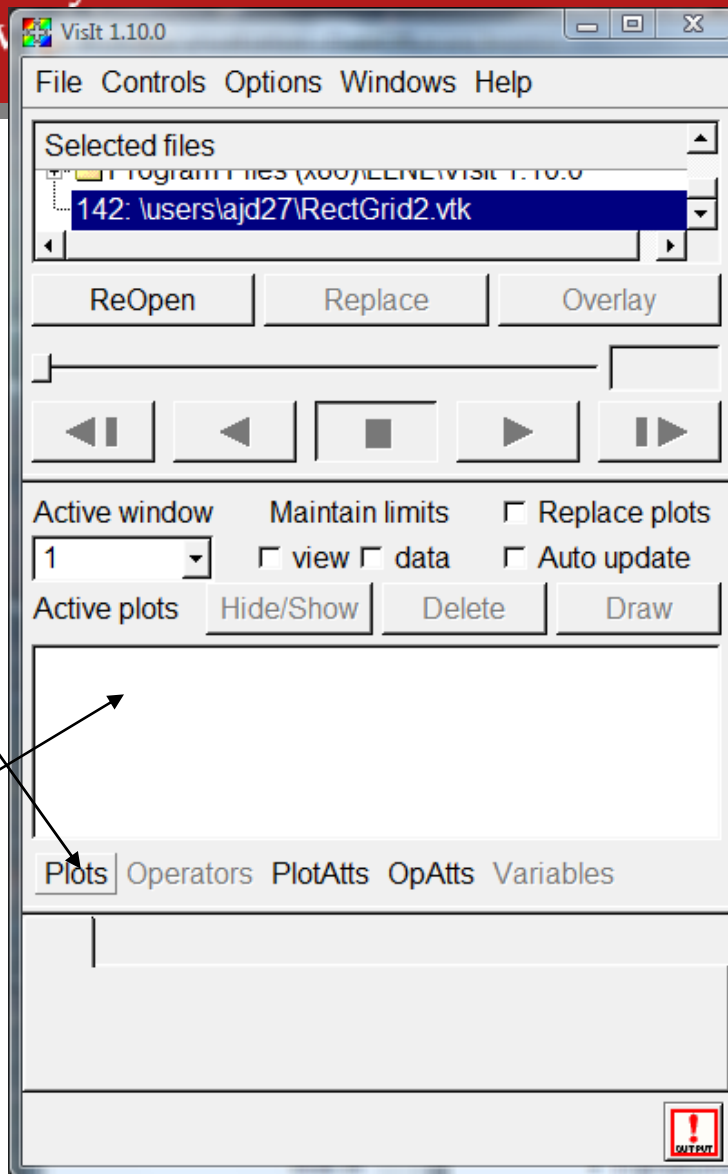
- Run it like Paraview, except “load module visit.”
- Terminology
 - Database = file or set of files that are timesteps
 - Plot = Mapping algorithm
 - Pseudocolor plot = scalar color map
 - Surface plot = 3D isosurface of 2D data
 - Volume = volume rendered in 3D
 - Operator = Data manipulation algorithm
 - Slice = extract data
 - Resample = change data resolution
 - Transform = move in space or time

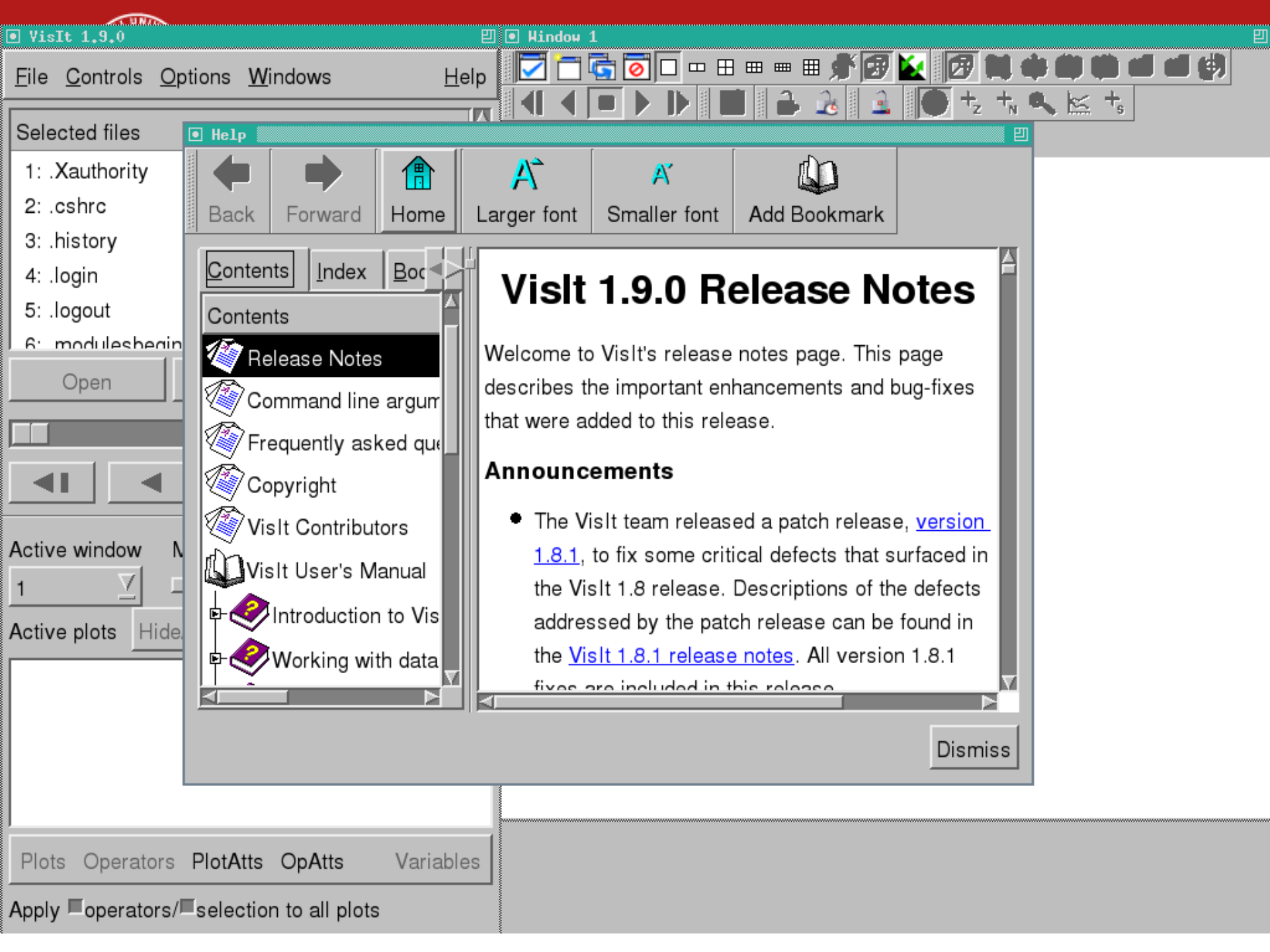


List of files in current directory. Select RectGrid2.

Click Plots to do something to the data.

Your plot will show as a line up here. Double-click the line to set plot properties.





Selected files

- 1: .Xauthority
- 2: .cshrc
- 3: .history
- 4: .login
- 5: .logout
- 6: modulesherin

Open

Active window

1

Active plots Hide

Plots Operators PlotAtts OpAtts Variables

Apply operators/ selection to all plots

Help

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- VisIt User's Manual
- Introduction to VisIt
- Working with data

VisIt 1.9.0 Release Notes

Welcome to VisIt's release notes page. This page describes the important enhancements and bug-fixes that were added to this release.

Announcements

- The VisIt team released a patch release, [version 1.8.1](#), to fix some critical defects that surfaced in the VisIt 1.8 release. Descriptions of the defects addressed by the patch release can be found in the [VisIt 1.8.1 release notes](#). All version 1.8.1 fixes are included in this release.

Dismiss



- Selected files
- 10: .soft
 - 11: .viminfo
 - 12: RectGrid2.vtk
 - 13: job
 - 14: job~
 - 15: naraview_lab.tar

Open Replace Overlay



Active window Maintain limits Replace plots
 1 view data Auto update

Active plots Hide/Show Delete Draw



Plots Operators PlotAtts OpAtts Variables

Apply operators/ selection to all plots

Boundary
Contour
Curve
Filled Boundary
Histogram
Label
Mesh
Molecule
Parallel Coordinates
Pseudocolor
Scatter
Spreadsheet
Streamline
Subset
Surface
Tensor
Truecolor
Vector
Volume

Overlay

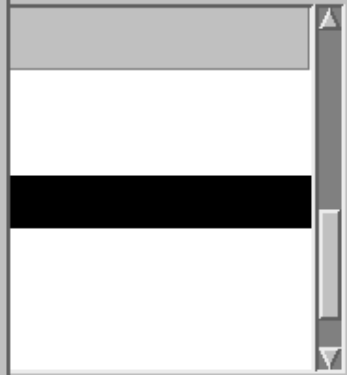
limits Replace plots
data Auto update

Delete Draw

Plots Operators PlotAtts OpAtts Variables

Window 1

Windows Help



Overlay



Apply operators/ selection to all plots

- Boundary
- Contour
- Curve
- Filled Boundary
- Histogram
- Label
- Mesh
- Molecule
- Parallel Coordinates
- Pseudocolor
- Scatter
- Spreadsheet
- Streamline
- Subset
- Surface
- Tensor
- Truecolor
- Vector
- Volume

Windows Help



ce Overlay

scalars
vectors_magnitude

units Replace plots
data Auto update

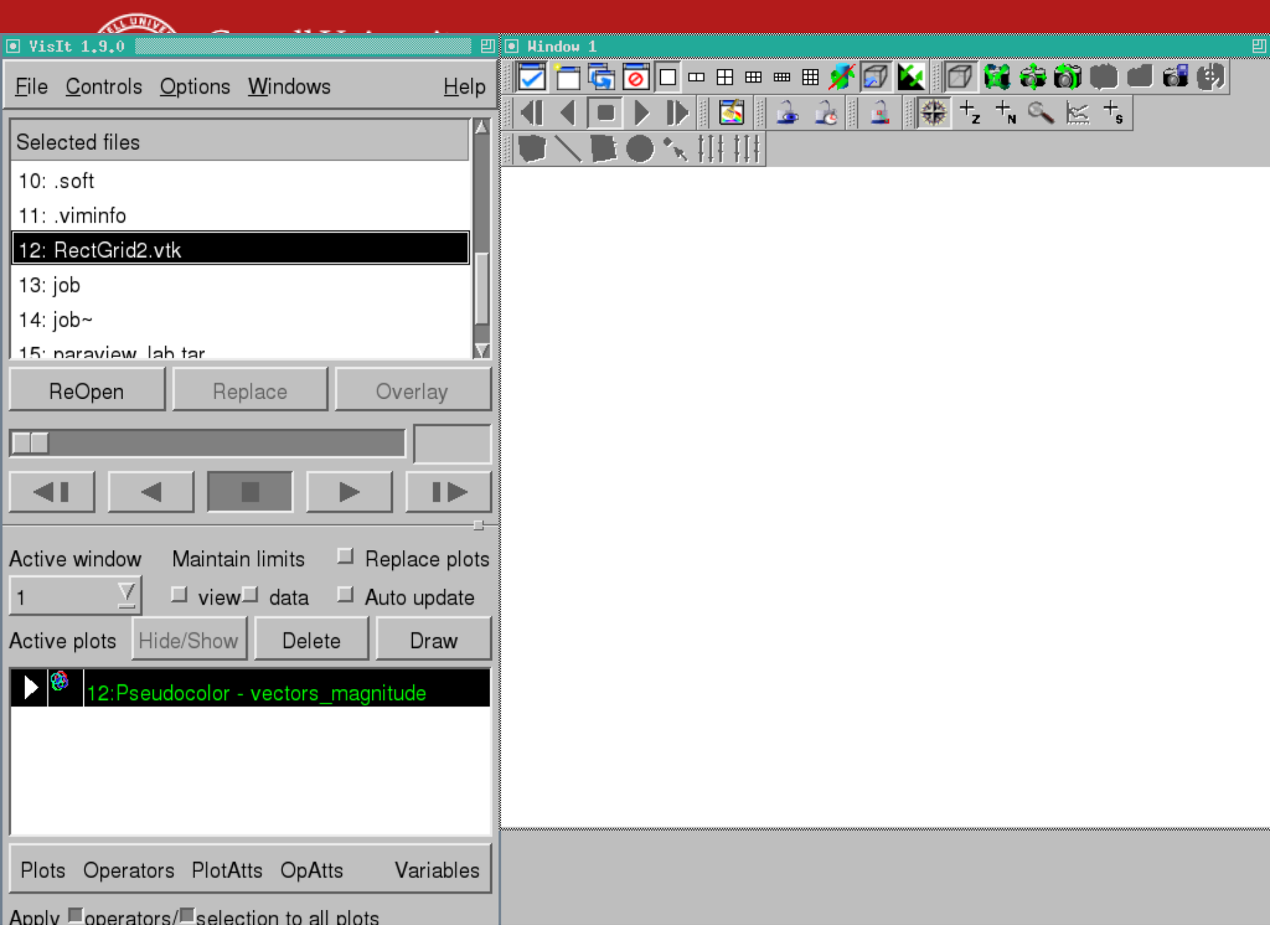
Delete Draw

Plots Operators PlotAtts OpAtts Variables

Apply operators/ selection to all plots

Window 1





VisIt 1.9.0

Window 1

File Controls Options Windows Help

Selected files

- 10: .soft
- 11: .viminfo
- 12: RectGrid2.vtk**
- 13: job
- 14: job~
- 15: naraview_lah.tar

ReOpen

Replace

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view data Auto update

Active plots Hide/Show Delete Draw

12:Pseudocolor - vectors_magnitude

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- 10: .soft
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- 13: job
- 14: job~
- 15: naraview_lah.tar

ReOpen Replace Overlay

Active window: 1

Maintain limits Replace plots

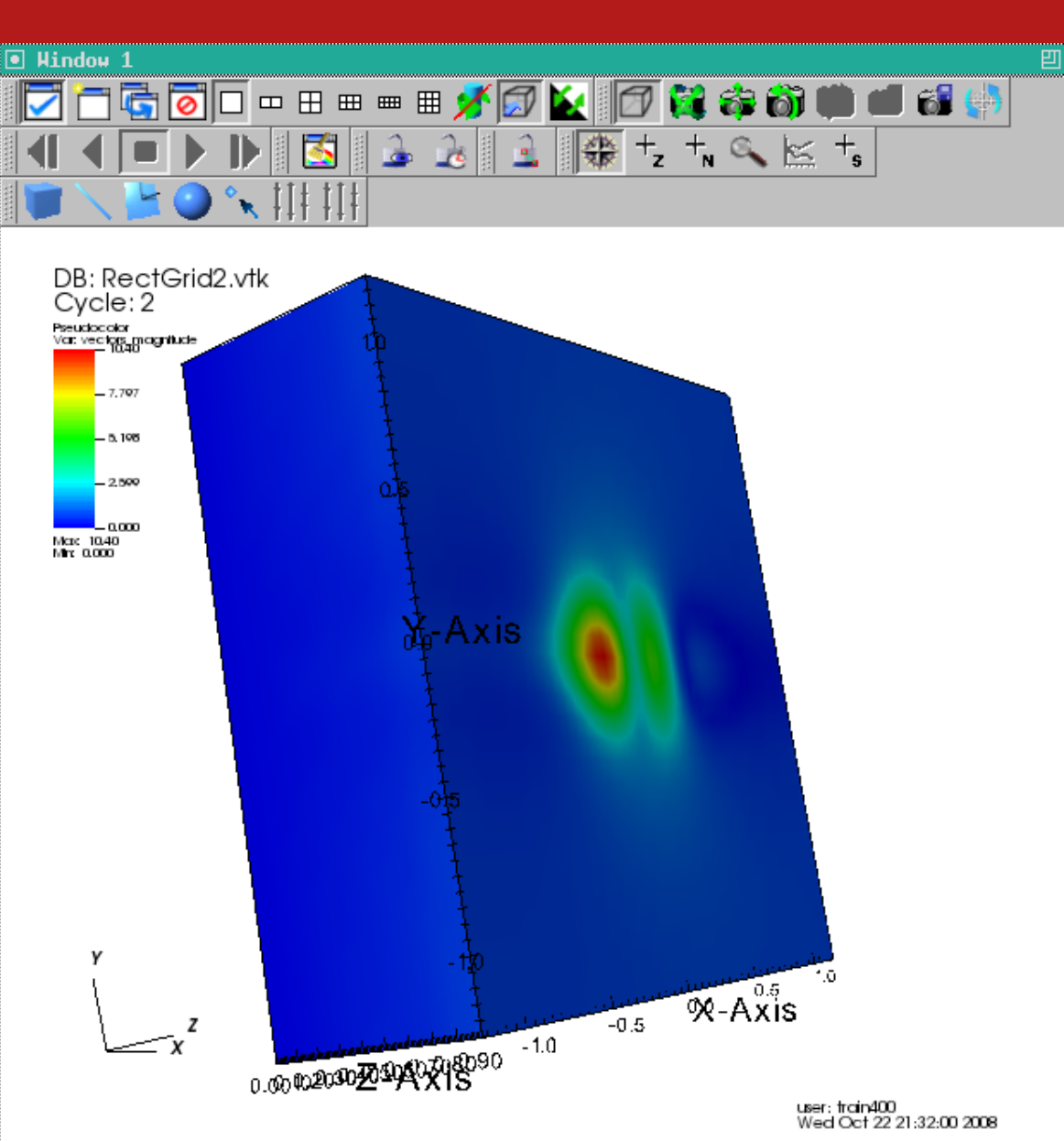
view data Auto update

Active plots: Hide/Show Delete Draw

▶ 12:Pseudocolor - vectors_magnitude

Plots Operators PlotAtts OpAtts Variables

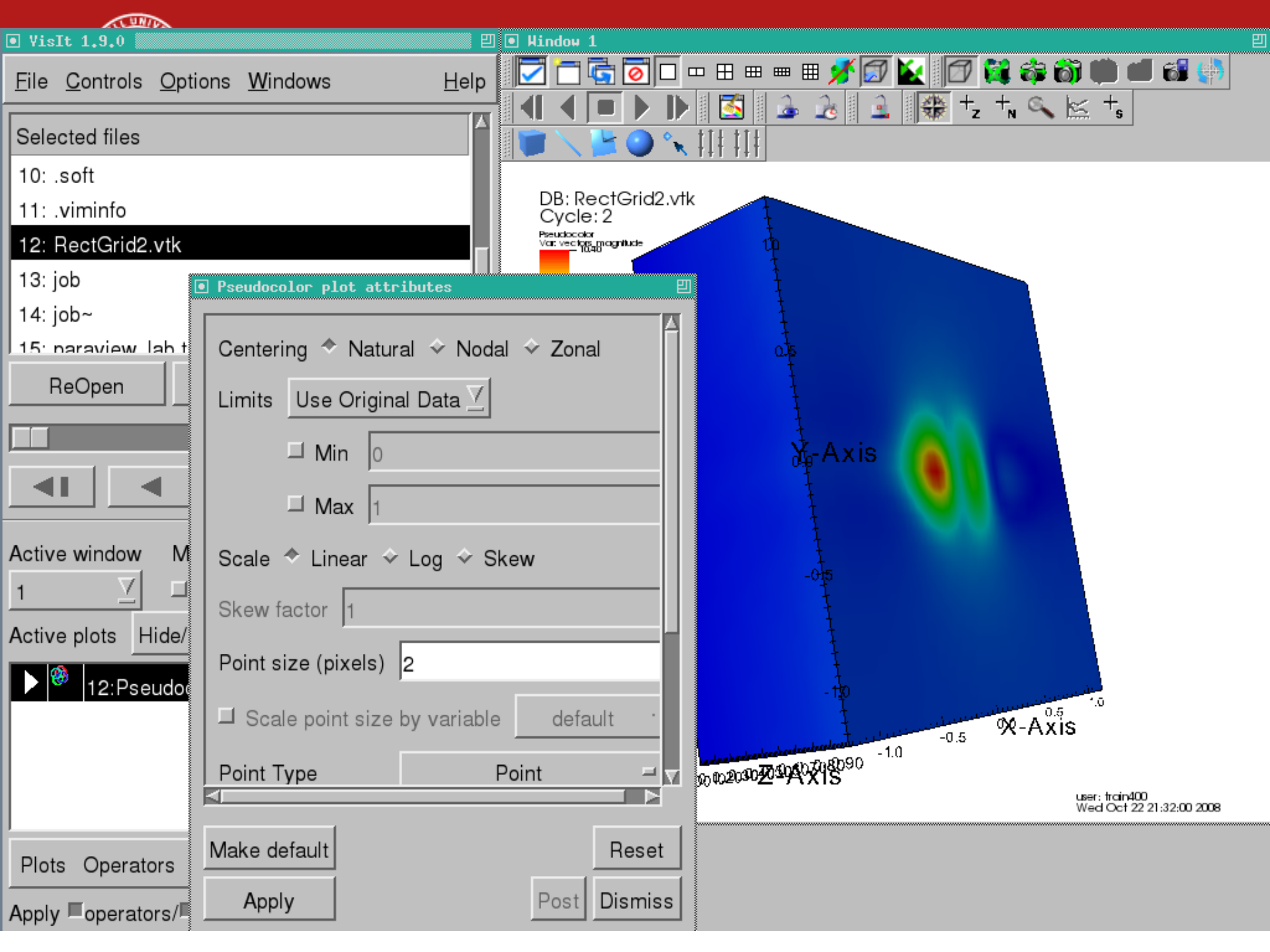
Apply operators/ selection to all plots





File information

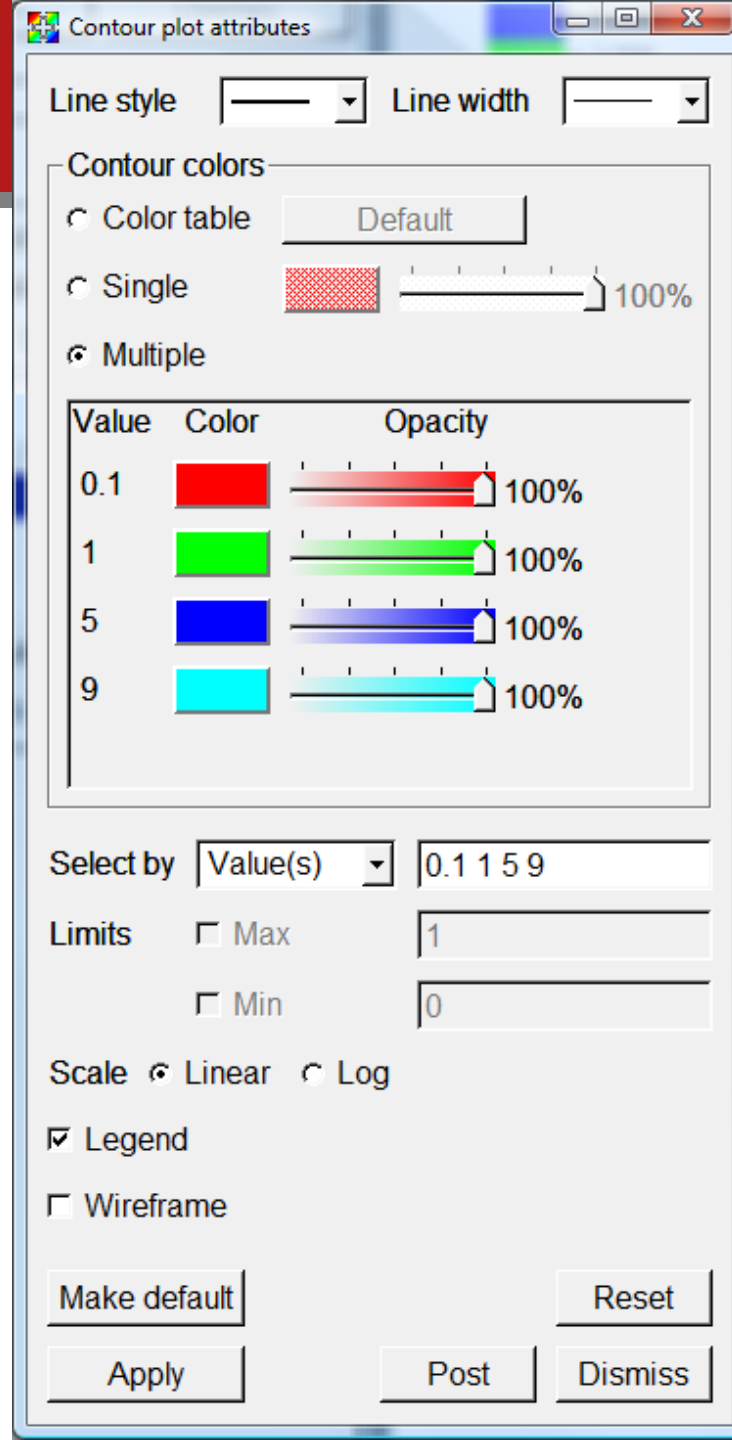
All Times are ***NOT*** Accurate
Times: 0
All Cycles are Accurate
Cycles: 2
Meshes:
 Name = mesh
 Number of blocks = 1
 Block origin = 0
 Cell origin = 0 (origin within one block of the cells).
 Node origin = 0 (origin within one block of the nodes).
 Group origin = 0
 Title for domain hierarchy is domains
 Title for individual piece in domain hierarchy is domain
 Number of groups = 0
 Title for group hierarchy is groups
 Title for individual piece in group hierarchy is group
 Mesh type is Rectilinear Mesh.
 Spatial Dimension = 3
 Topological Dimension = 3
 Extents are: ((-1.22396, 1.17188), (-1.25, 1.25), (0, 0.9))
 There are no names set with the blocks.
 Disjoint elements false
 Contains ghost zones 3
 Contains original cells 0
 Contains original nodes 0
 Units = x: "", y: "", z: ""
 Labels = x: "X-Axis", y: "Y-Axis", z: "Z-Axis".
 Mesh coord type is XY
 Mesh is primarily cell-based
 Unit cell vector #0 is 1 0 0
 Unit cell vector #1 is 0 1 0
 Unit cell vector #2 is 0 0 1
 Rectilinear grids do not have an implicit transform.





Contour Plot

- Select Contour Plot.
- Double-click.
- Set an array of values.



VisIt 1.9.0

File Controls Options Windows Help

Selected files

- 10: .soft
- 11: .viminfo
- 12: RectGrid2.vtk
- 13: job
- 14: job~
- 15: naraview_lah.tar

ReOpen Replace Overlay

Active window: 1

Maintain limits Replace plots

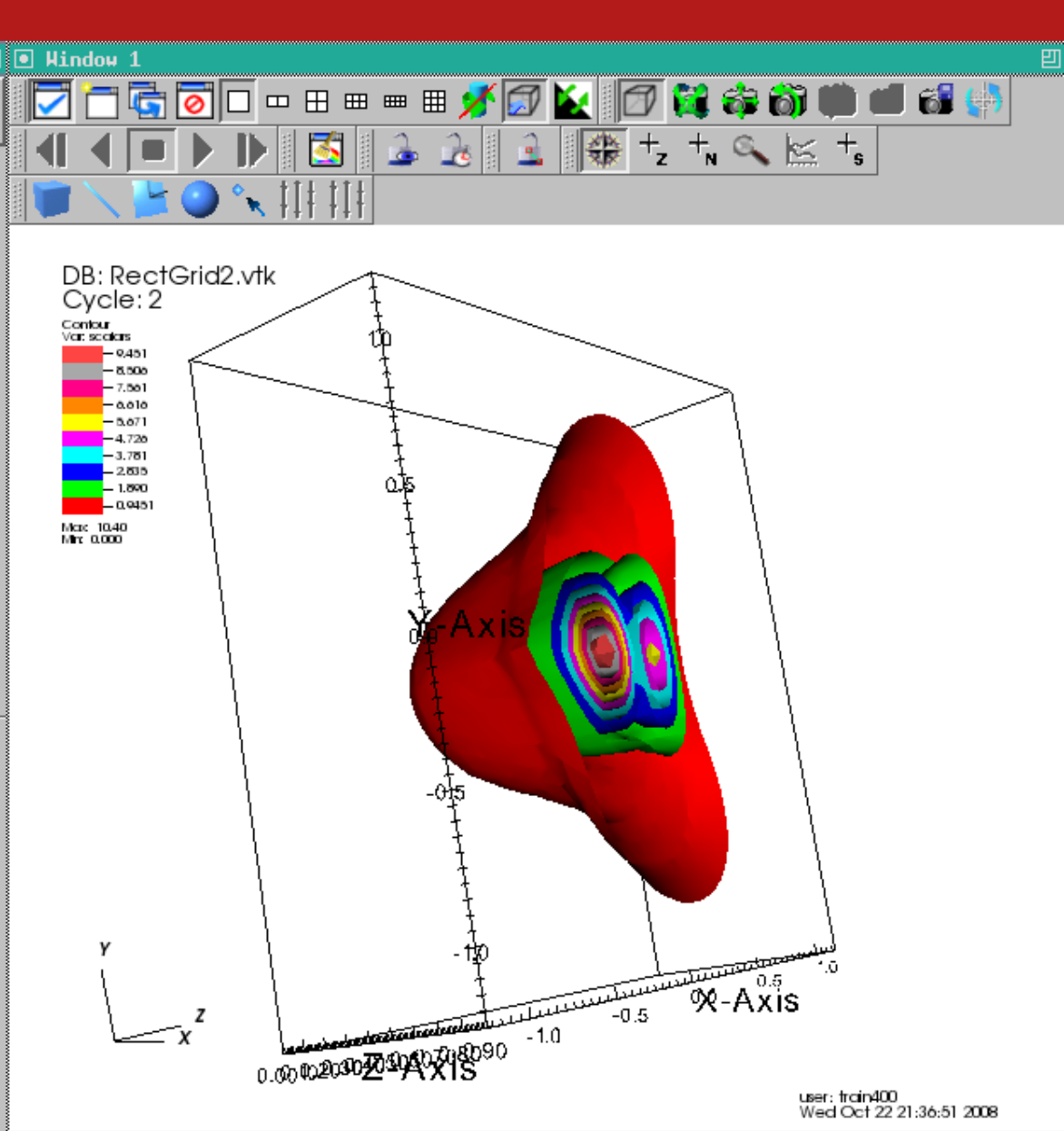
view data Auto update

Active plots: Hide/Show Delete Draw

- ▶ 12:Pseudocolor - vectors_magnitude (hidde)
- ▶ 12:Contour - scalars

Plots Operators PlotAtts OpAtts Variables

Apply operators/ selection to all plots





Could also Contour from Pseudocolor

- Adding a Contour operator to a pseudocolor plot does the same thing as a Contour plot.
- Operators apply BEFORE the plot.
- They have an order. Try slicing different ways before the pseudocolor plot.



Volume Plot

- Opacity very important.
- Play with black-and-white graph.

Volume plot attributes

Color

+ - Align Default Smooth Equal

Min 0 Max 0

Scale Linear Log10 Skew

Skew factor 1

Opacity

Show Colors Interaction mode Freeform Gaussian

Attenuation 100%

Opacity variable default

Min 0 Max 0

Rendering method Splatting

Number of samples 50000

Number of slices 200

Samples per ray 500

Sampling rate 3.000

Gradient method Centered diff Sobel

Sampling method Rasterization Kernel Based

Transfer Function 1D 2D

Legend Lighting Smooth Data

Make default Apply Reset Post Dismiss

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Window 1

File Controls Options Windows Help

Selected files

12: RUN.vnc~

13: RectGrid2.vtk

14: err.txt

15: err2.txt

16: job

17: job~

ReOpen

Replace

Overlay

Active window Maintain limits Replace plots

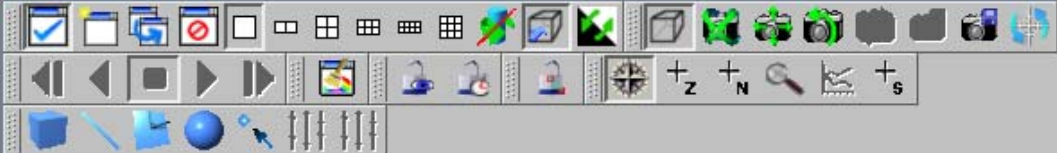
1 view data Auto update

Active plots Hide/Show Delete Draw

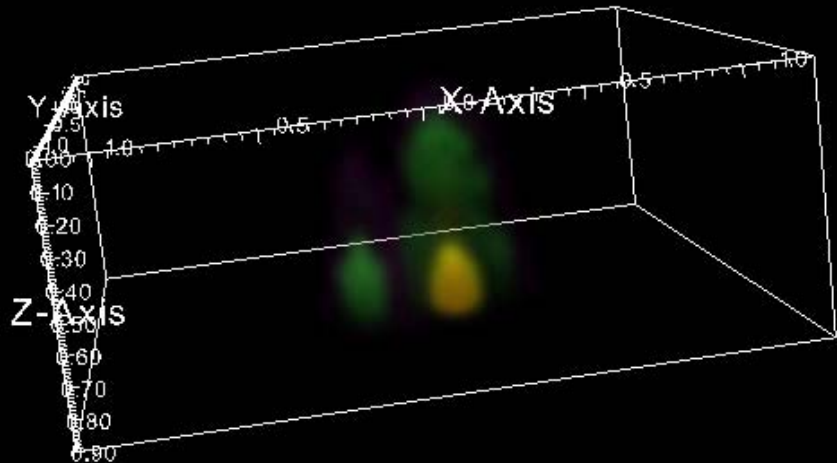
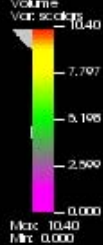
- ▶ 13:Pseudocolor - vectors_magnitude (hidde)
- ▶ 13:Contour - scalars (hidden)
- ▶ 13:Streamline - vectors (hidden)
- ▶ 13:Volume - scalars

Plots Operators PlotAtts OpAtts Variables

Apply operators/selection to all plots



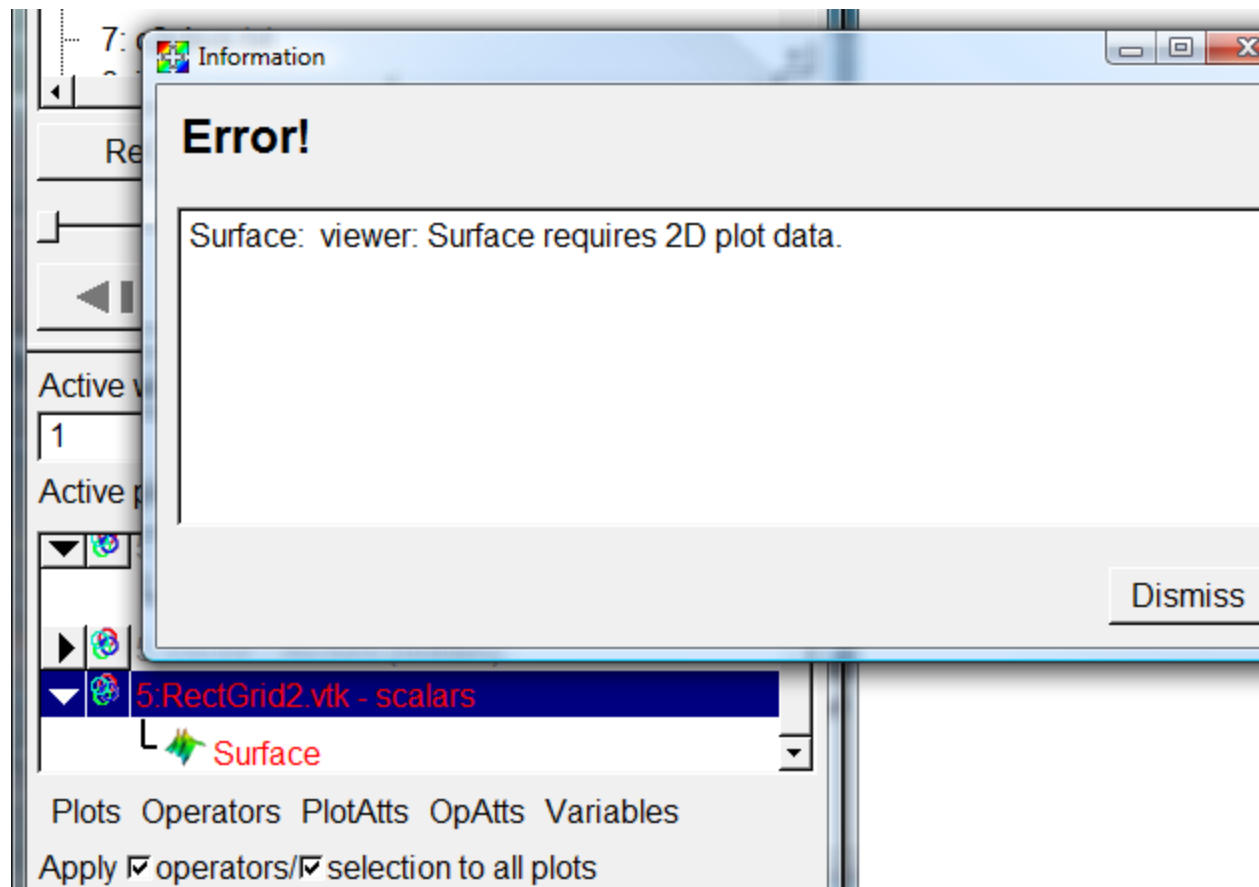
DB: RectGrid2.vtk
Cycle: 2





Surface Plot

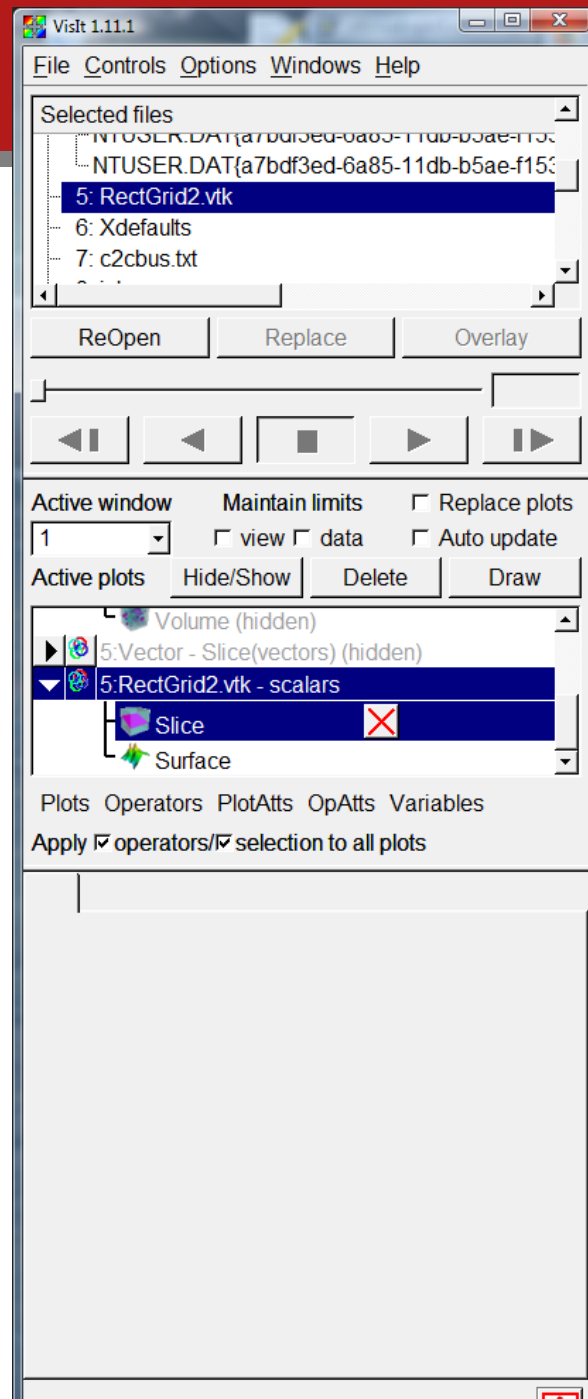
- Maps a 2D surface
- Not for 3D input data
- If you draw it fails?
- What steps to use?





Slice It First

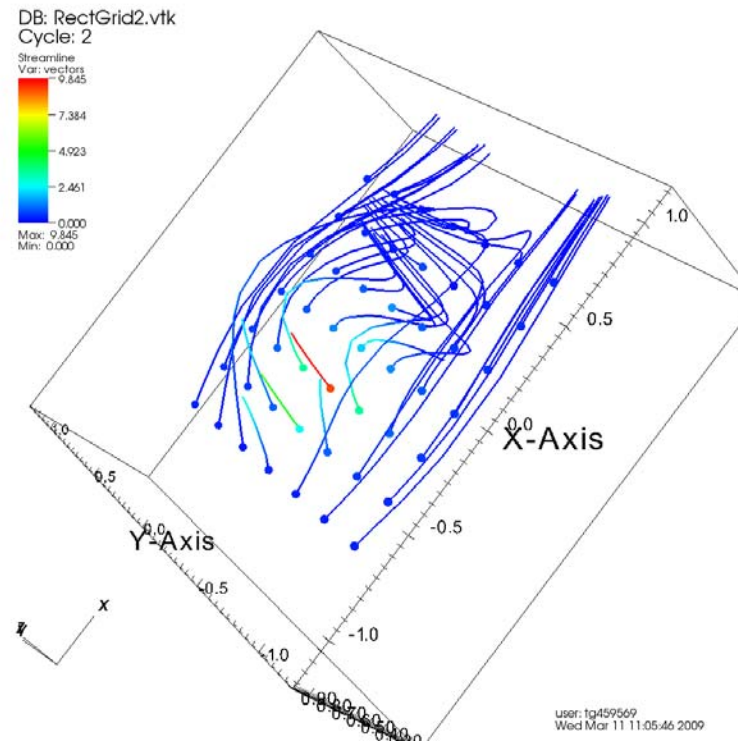
- The slice operator yields a 2D surface.
- Then you can extrude that surface.





Streamline

- Turn off auto-draw if it's on.
- Set options to use a Plane.
 - Point density 6
 - Origin 0 0 0.5
 - Rest defaults
 - Apply and Draw
- Crashes my PC. Fine on Spur node.
- Try “show start” and reducing the radius to 0.01.





Command-Line Interface

- What you would use on Ranger.
- Can start a parallel job.
- Gives puppet-control over client. Can't send data.
- Best used through “vglrun visit -cli”. “import visit” is painfully weird.
- Example for job submission in Spur User Guide.



Visit CLI Example

```
vis4% vglrun visit -cli
Running: cli1.10.0
Running: viewer1.10.0 -host 127.0.0.1 -noint -port 5600
Python 2.5 (r25:51908, Oct 21 2008, 17:52:41)
[GCC Intel(R) C++ gcc 3.4 mode] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>>fn='RectGrid2.vtk'
>>>res=OpenDatabase(fn)
>>>GetMetaData(fn)
>>>PlotPlugins()
>>>AddPlot('Pseudocolor','scalars')
>>>DrawPlots()
>>><Ctrl-d to exit>
```



Customizing a Plot

- Customize plots by creating an Attributes object and setting its properties.

```
TMAAttributes = visit.ScatterAttributes()  
#var1 is already set while adding the plot  
TMAAttributes.var2 = 'temp'  
TMAAttributes.var2Role = 1  
#Set var3 to color and get the colorby2 to determine the actual variable  
TMAAttributes.var3 = 'red'  
TMAAttributes.var3Role = 3
```

```
import silo
import numpy
import pyublas
```

How to Make Silo

```
def makeXRPlot(AllData):
```

```
    """This function creates a x y scatter plot that can be colored by temperature.
    mixing fraction, or weight. AllData is just a big 2D numpy matrix, where I
    know what columns correpond to."""
```

```
    if os.path.exists('Particles.silo'):
```

```
        os.remove('Particles.silo')
```

```
    sf = pylo.SiloFile('Particles.silo')
```

```
    temp = numpy.asarray(AllData[:,6])
```

```
    mixing = numpy.asarray(AllData[:,5])
```

```
    mesh = numpy.asarray(AllData[:,0:2])
```

```
    weight = numpy.asarray(AllData[:,2])
```

```
    x = AllData[:,0]
```

```
    r = AllData[:,1]
```

```
    sf.put_pointmesh('particles',numpy.asarray(mesh.transpose(),order="C") )
```

```
    sf.put_pointvar1('x','particles', numpy.asarray(x,order="C") )
```

```
    sf.put_pointvar1('r','particles', numpy.asarray(r,order="C") )
```

```
    sf.put_pointvar1('weight','particles', numpy.asarray(weight, order="C") )
```

```
    sf.put_pointvar1('mixing','particles', numpy.asarray(mixing, order="C") )
```

```
03/11/09 www.cac.cornell.edu
    sf.put_pointvar1('temp','particles', numpy.asarray(temp, order="C") )
```

```
    sf.close()
```