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

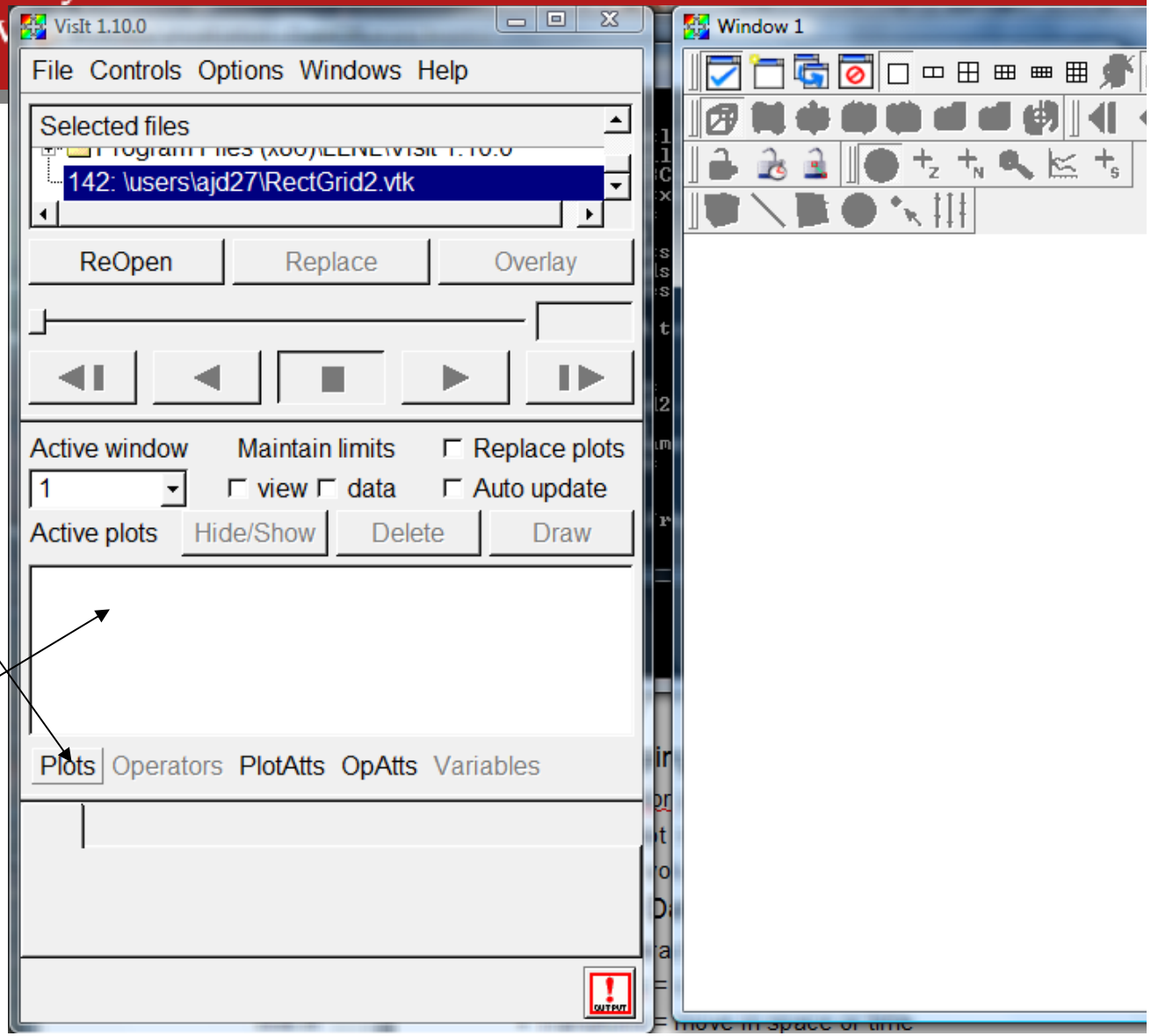
Visit on Spur

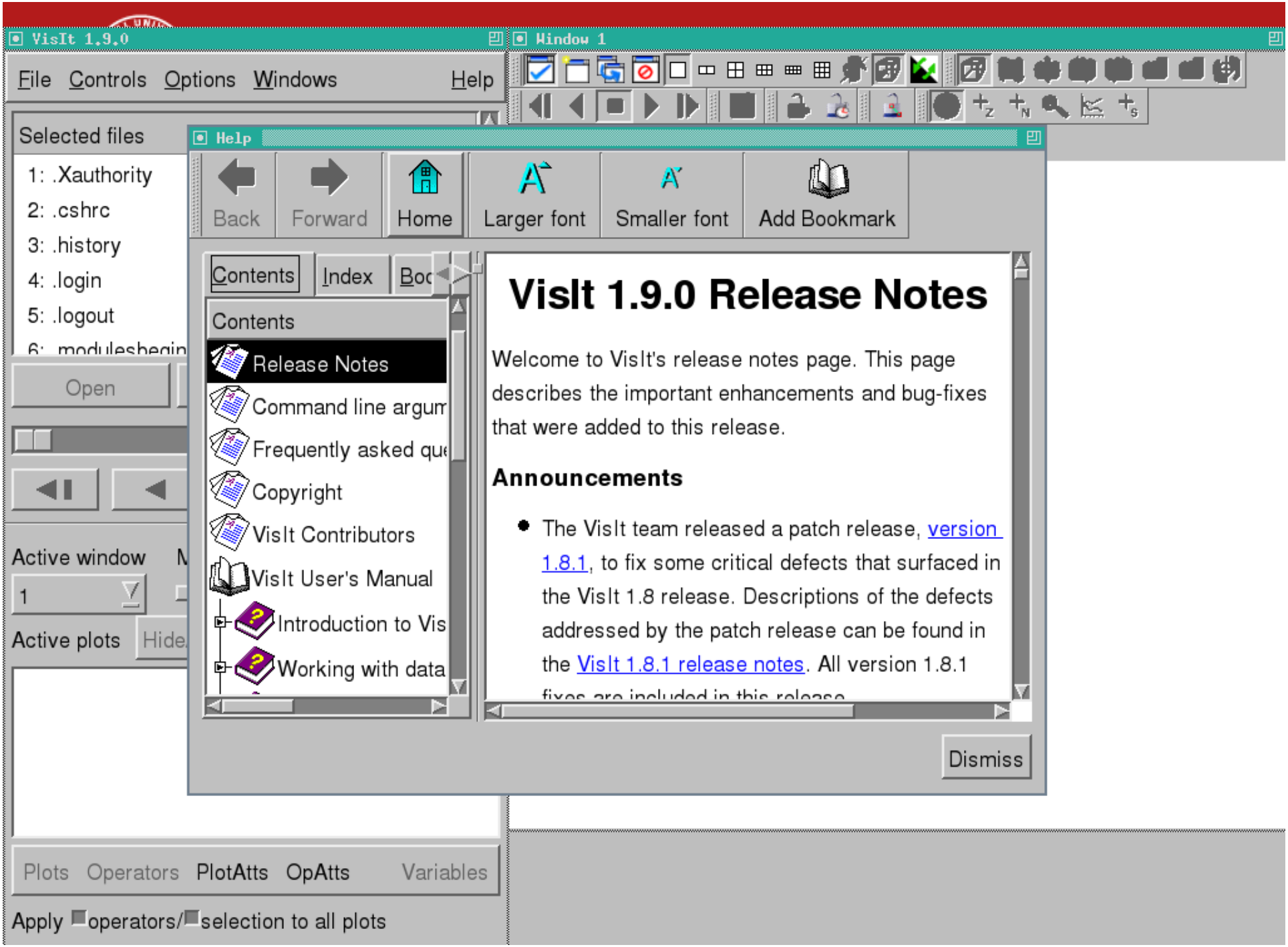
- Run it like Paraview, except “load module visit.”
- Terminology
  - Database = file or set of files that are timesteps
  - Plot = Mapping algorithm
    - Pseudocolor plot = scalar color map
    - Surface plot = 3D isosurface of 2D data
    - Volume = volume rendered in 3D
  - Operator = Data manipulation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




VisIt 1.9.0
File Controls Options Windows Help
Selected files
1: .Xauthority
2: .cshrc
3: .history
4: .login
5: .logout
Open
Active window
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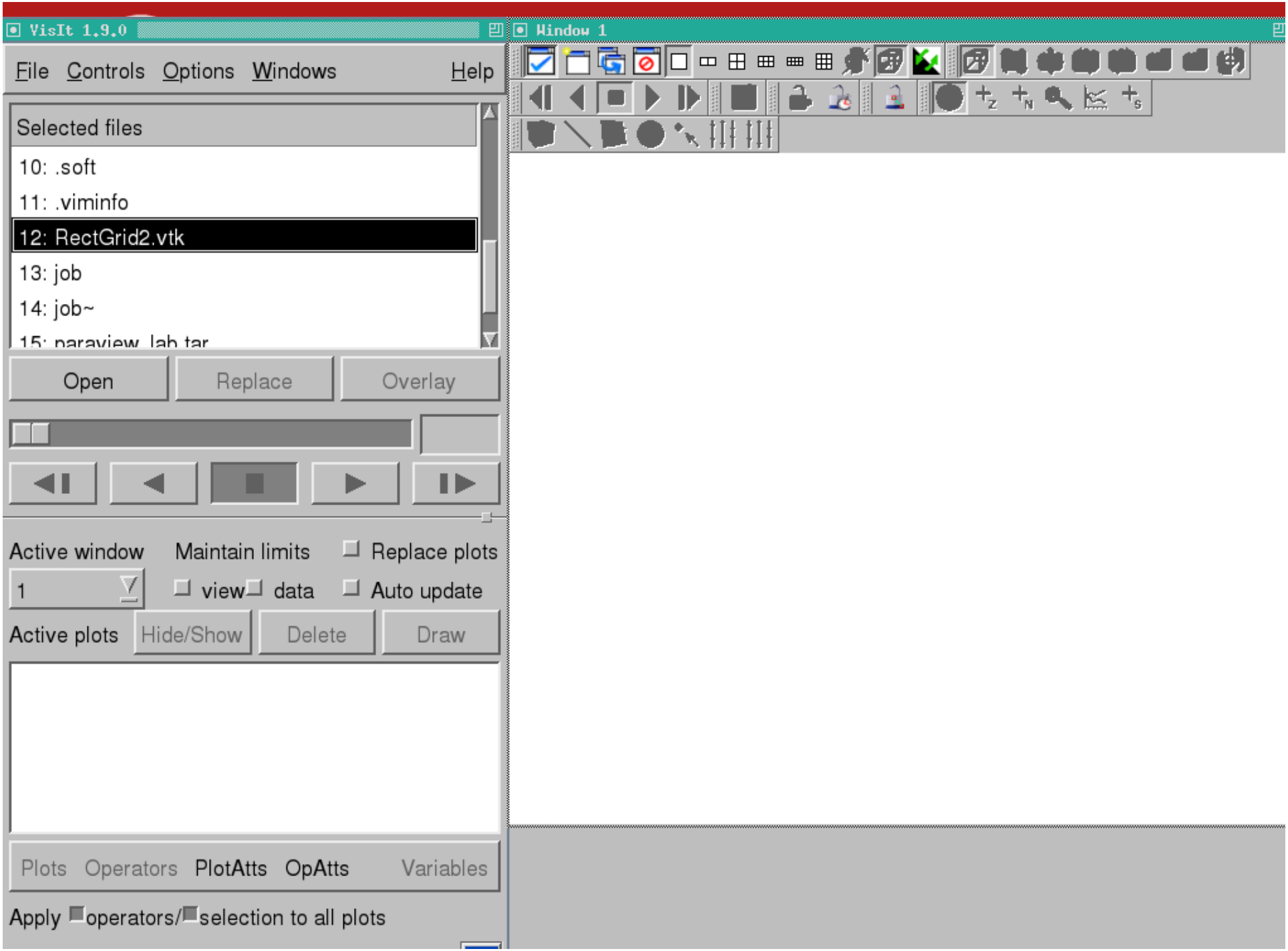
Copyright
VisIt Contributors
VisIt User's Manual
Introduction to Vis
Working with data
VisIt 1.9.0 Release Notes
Welcome to VisIt's release notes page. This page describes the important enhancements and bug-fixes that were added to this release.
Announcements
The VisIt team released a patch release, 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
Dismiss


VisIt 1.9.0
File Controls Options Windows Help
Selected files
10: .soft
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Apply operators/selection to all plots
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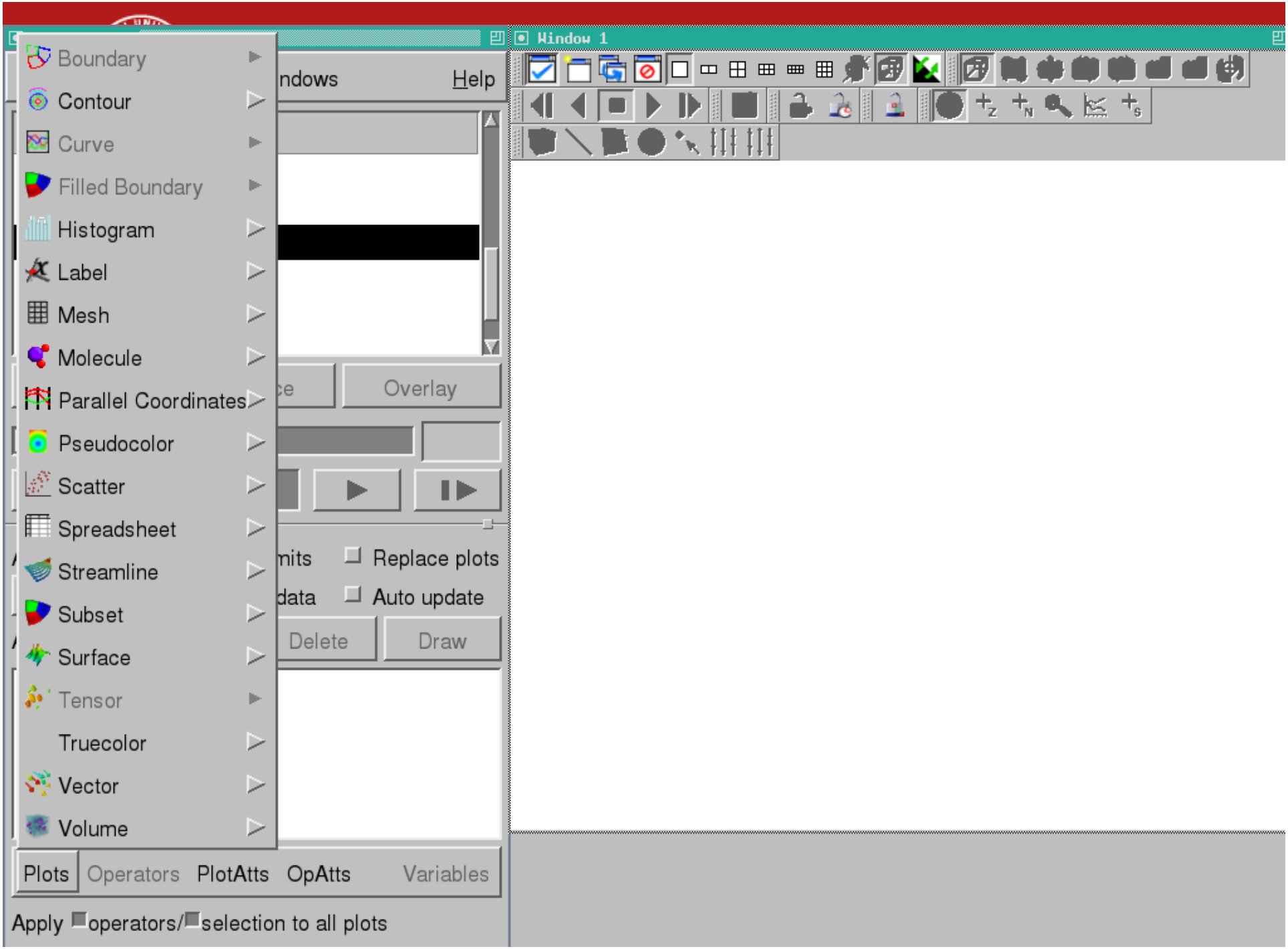
Boundary
Contour
Curve
Filled Boundary
Histogram
Label
Mesh
Molecule
Parallel Coordinates
Pseudocolor
Scatter
Spreadsheet
Streamline
Subset
Surface
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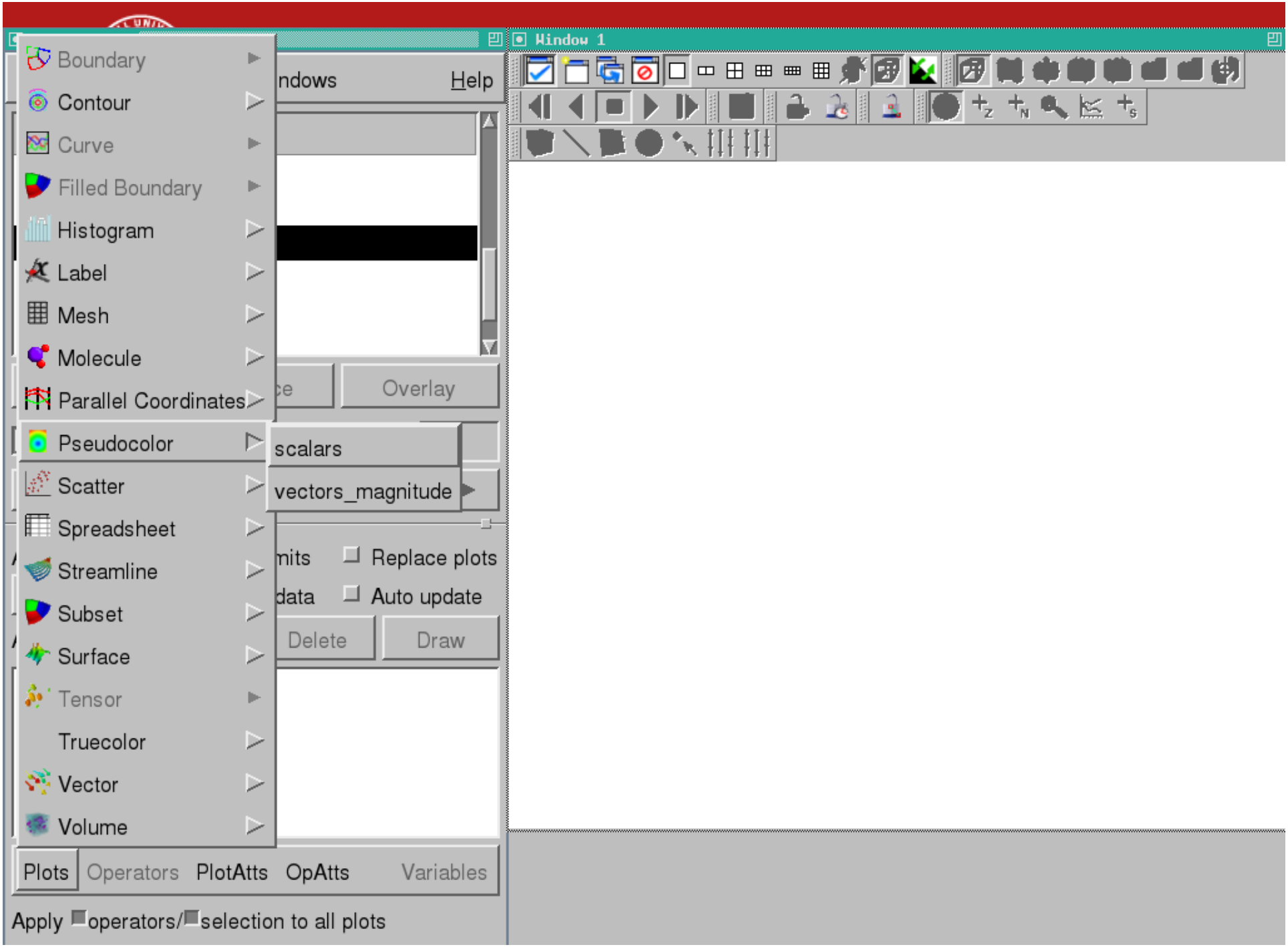
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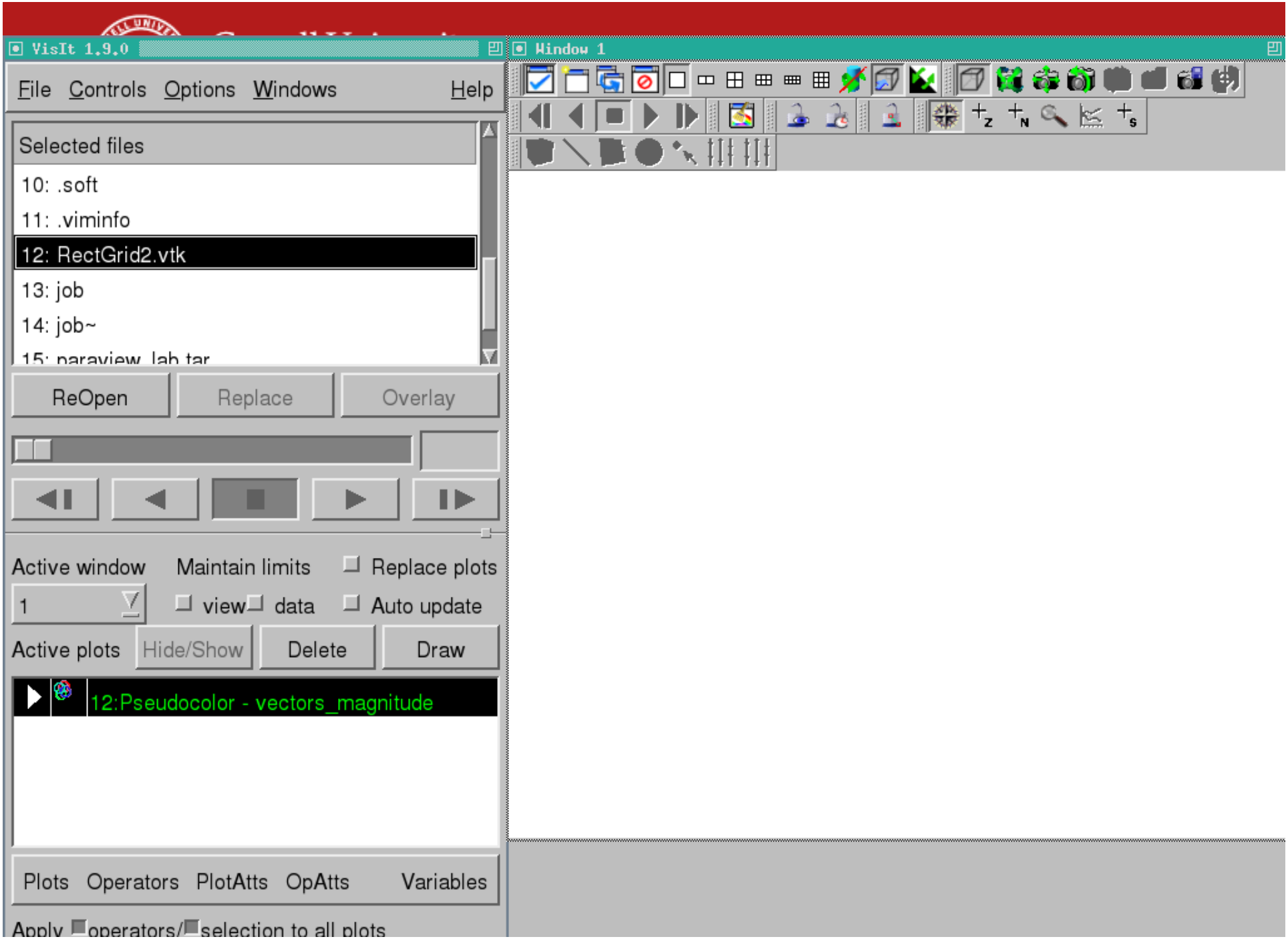
VisIt 1.9.0
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12:Pseudocolor - vectors_magnitude
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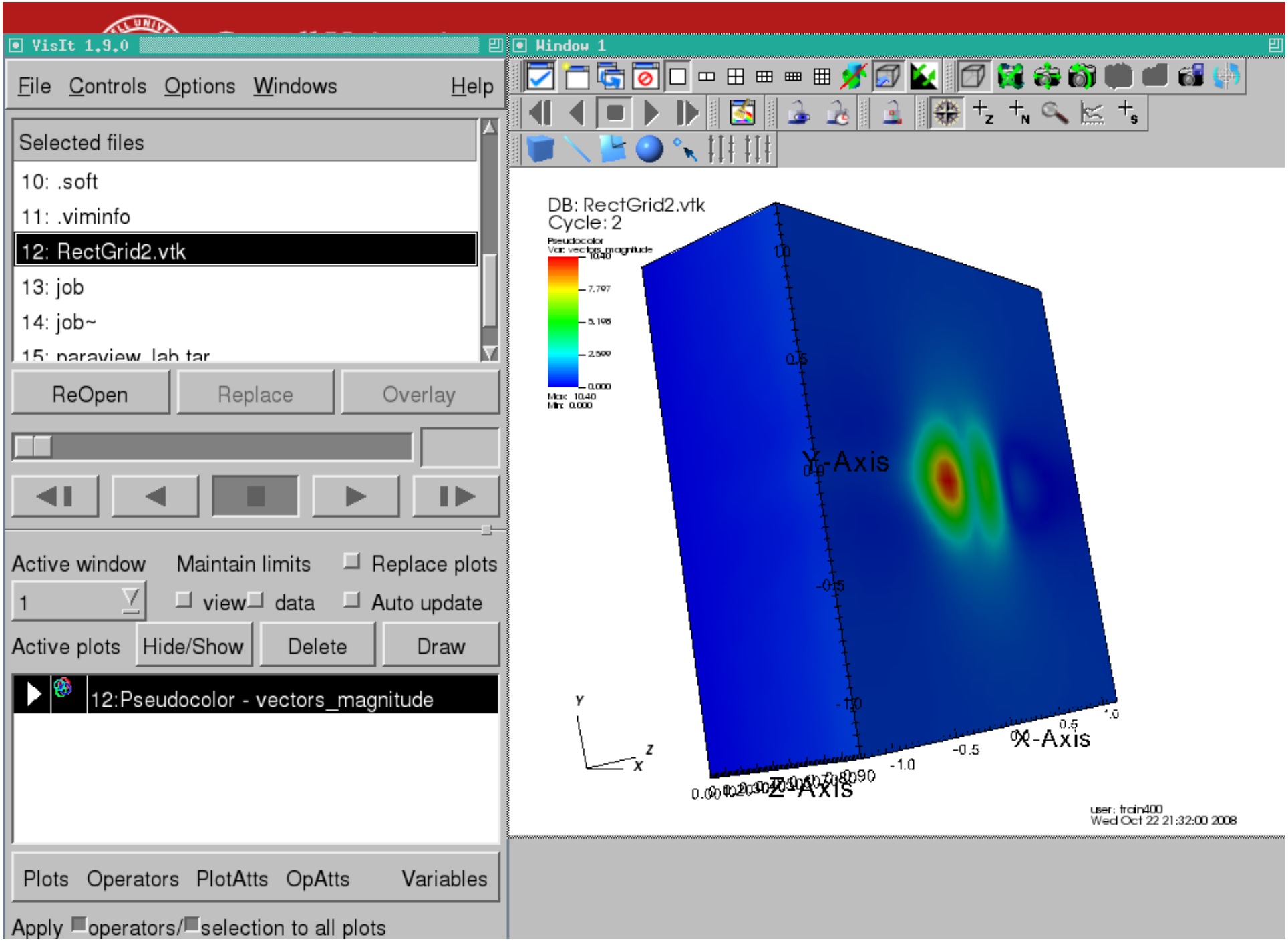
Apply operators/selection to all plots
Window 1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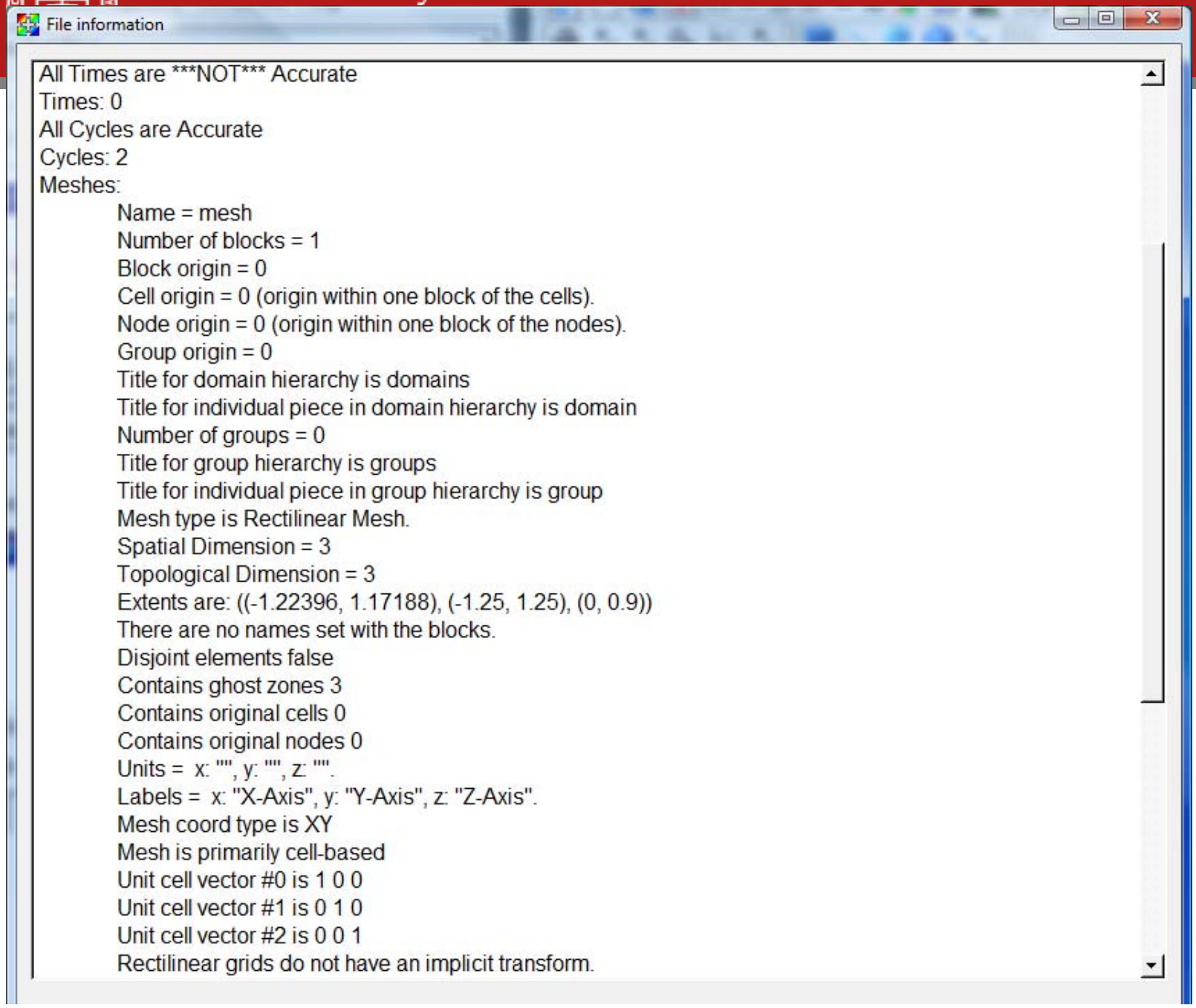
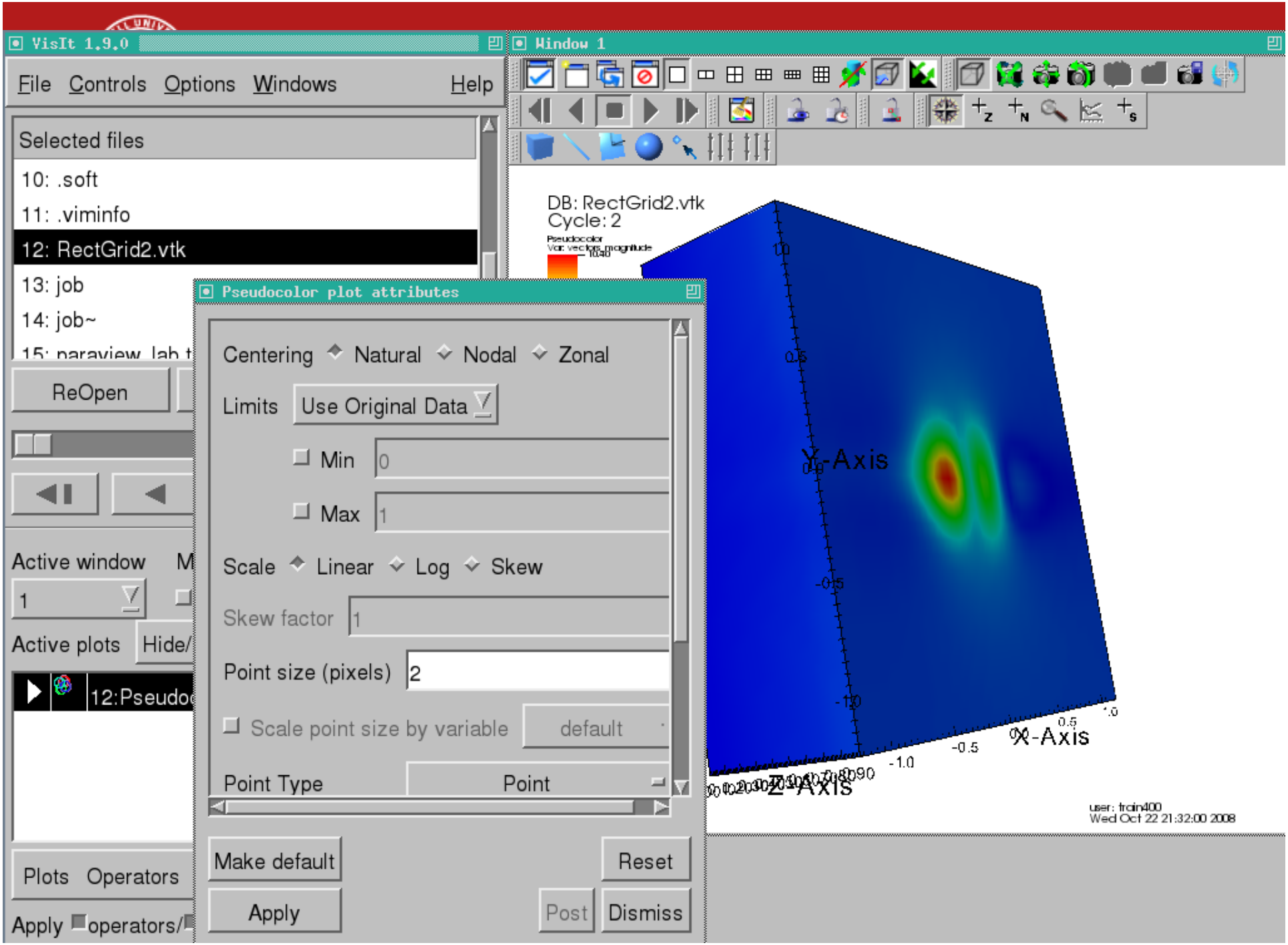
Window 1
DB: RectGrid2.vtk
Cycle: 2
Pseudocolor
Var: vectors_magnitude
10.40
7.797
5.198
2.599
0.000
Max: 10.40
Min: 0.000
Y-Axis
X-Axis
Z-Axis
user: train400
Wed Oct 22 21:32:00 2008


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.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Active plots
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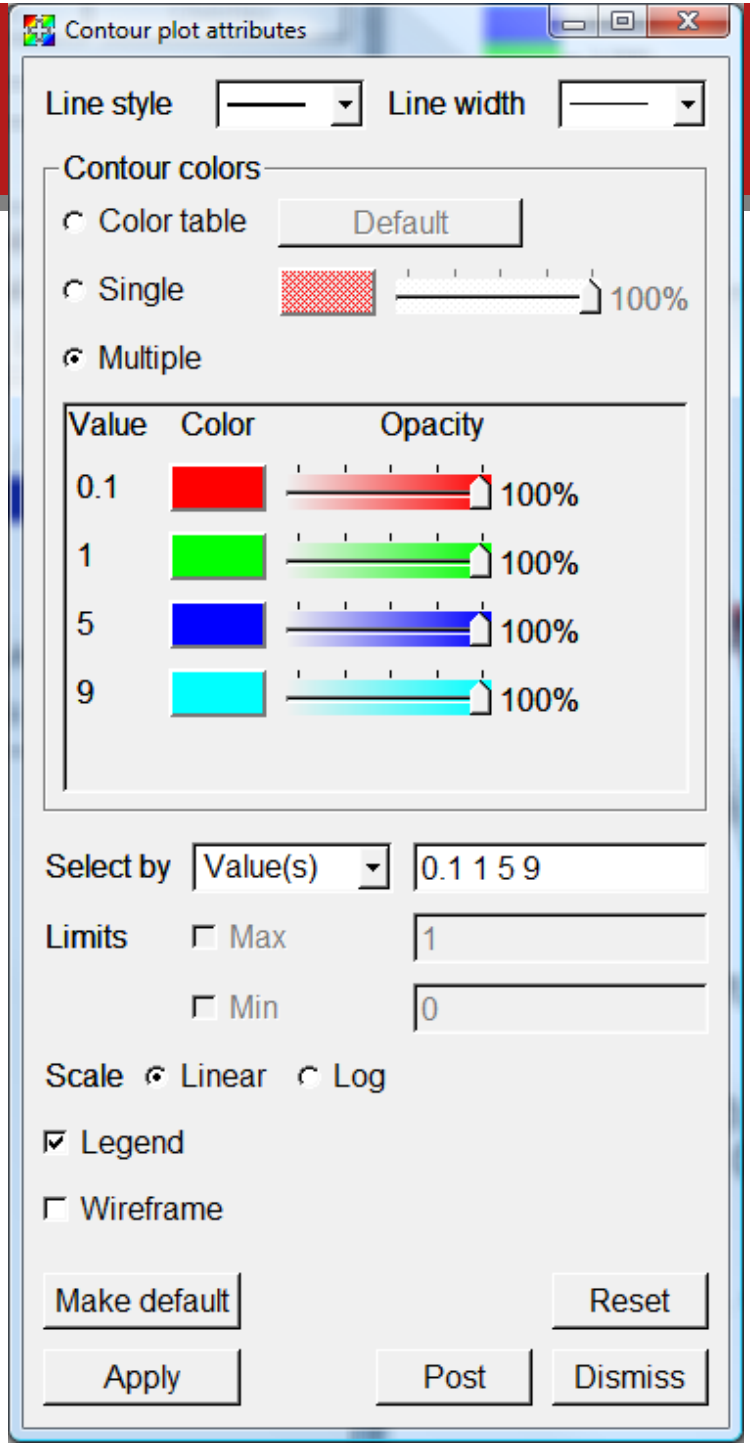
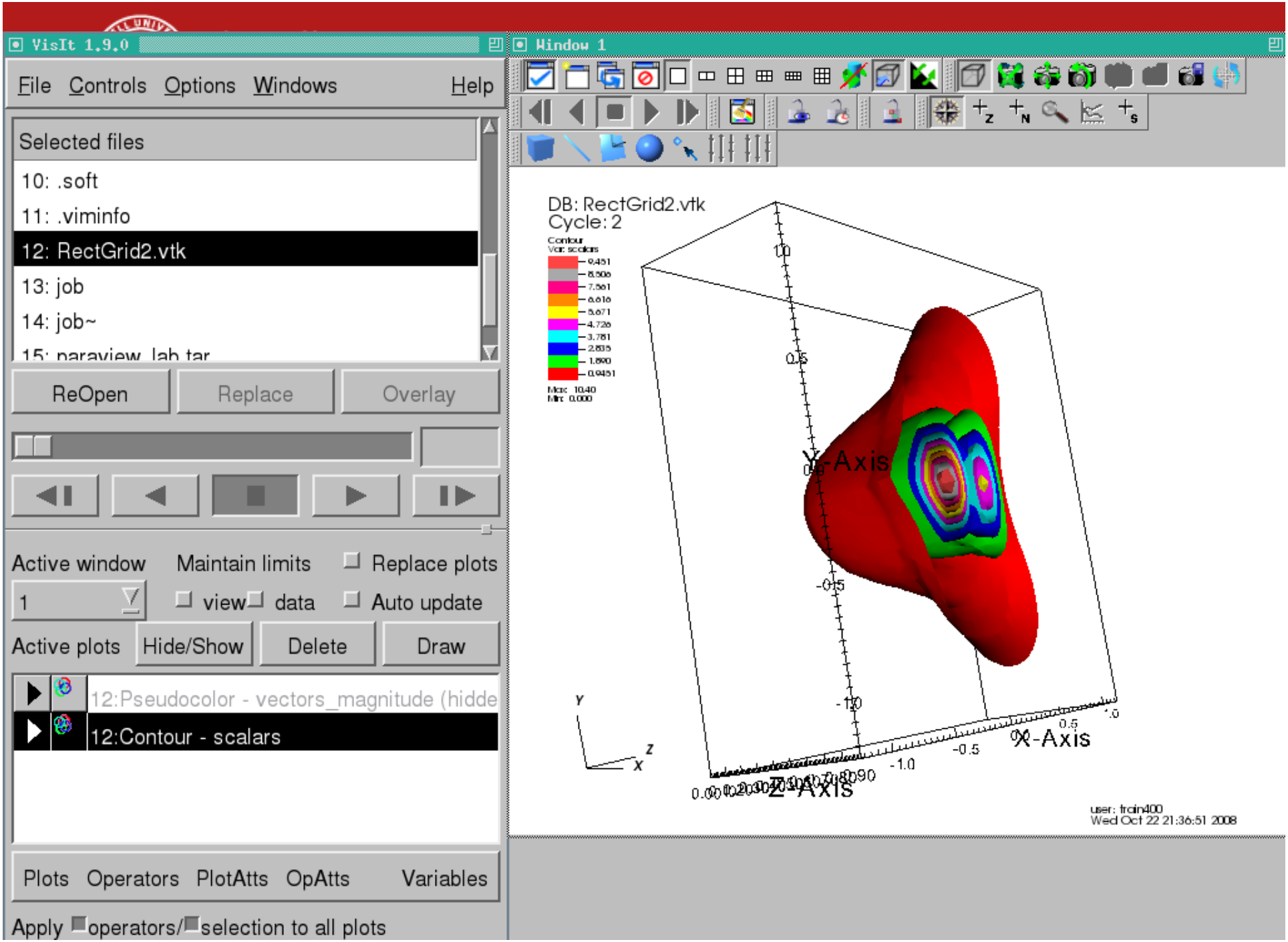
Apply operators/
Window 1
DB: RectGrid2.vtk
Cycle: 2
Pseudocolor
Var: vectors_magnitude
Y-Axis
X-Axis
Z-Axis
user: train400
Wed Oct 22 21:32:00 2008
Pseudocolor plot attributes
Centering Natural Nodal Zonal
Limits Use Original Data
Min 0
Max 1
Scale Linear Log Skew
Skew factor 1
Point size (pixels) 2
Scale point size by variable default
Point Type Point
Make default
Reset
Apply
Post
Dismiss

Contour Plot

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




VisIt 1.9.0
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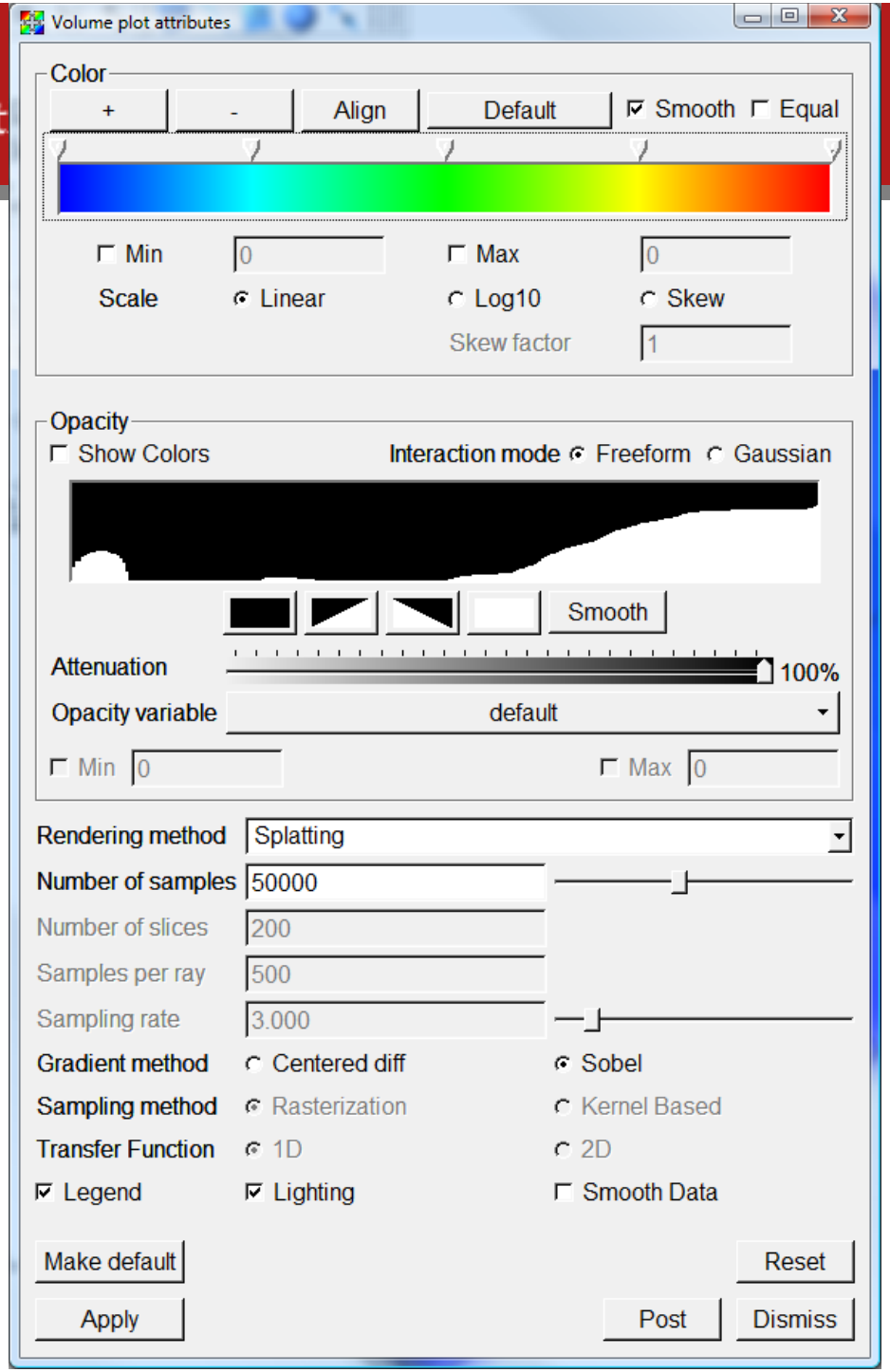
Draw
12:Pseudocolor - vectors_magnitude (hidde
12:Contour - scalars
Plots Operators PlotAtts OpAtts Variables
Apply operators/selection to all plots
Window 1
DB: RectGrid2.vtk
Cycle: 2
Contour
Var: scalars
9.451
8.506
7.561
6.616
5.671
4.726
3.781
2.835
1.890
0.9451
Max: 10.40
Min: 0.000
Y-Axis
X-Axis
Z-Axis
user: train400
Wed Oct 22 21:36:51 2008

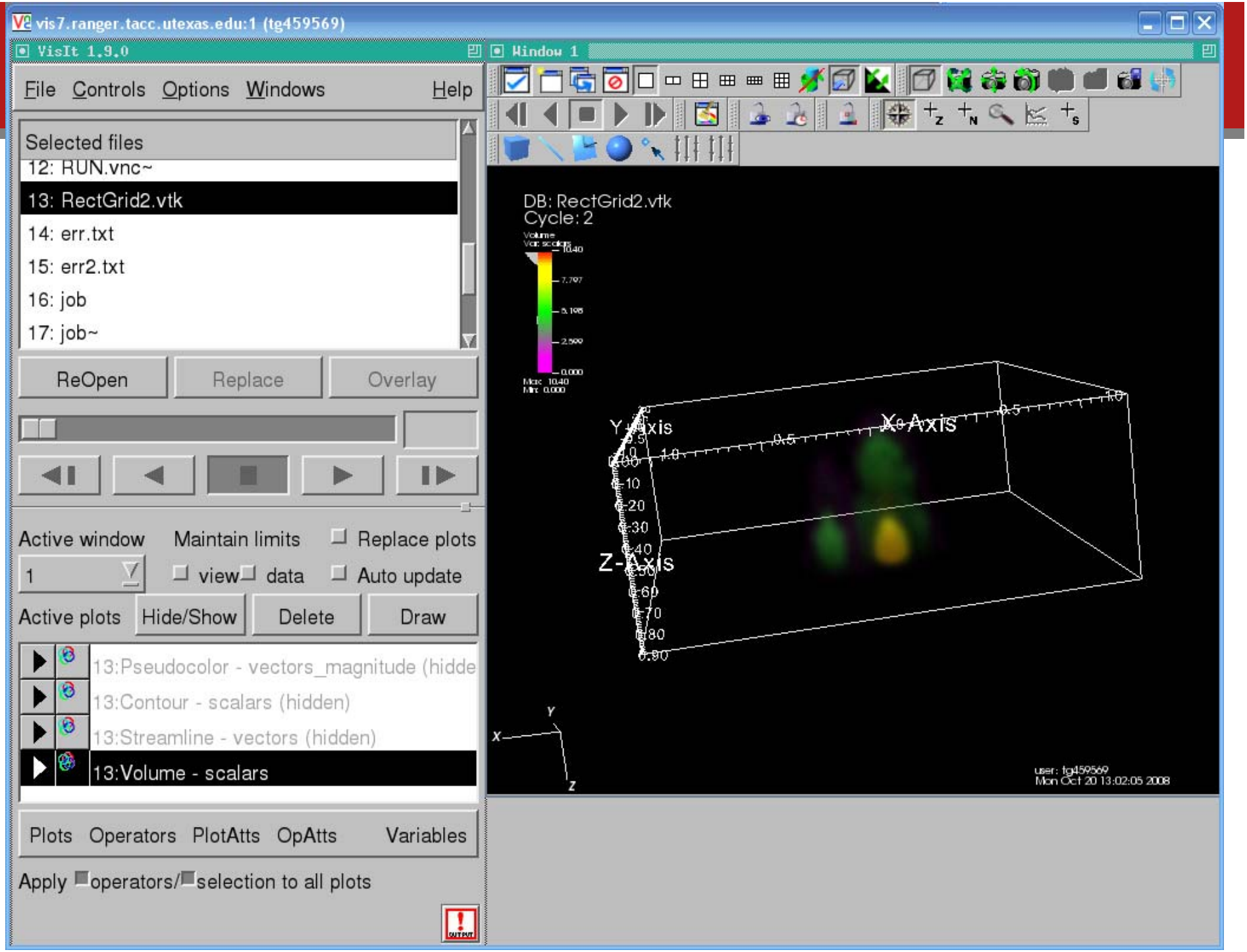
Could also Contour from Pseudocolor

- 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.




vis7.ranger.tacc.utexas.edu:1 (tg459569)
VisIt 1.9.0
File Controls Options Windows Help
Selected files
12: RUN.vnc~
13: RectGrid2.vtk
14: err.txt
15: err2.txt
16: job
17: job~
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Active plots
Hide/Show
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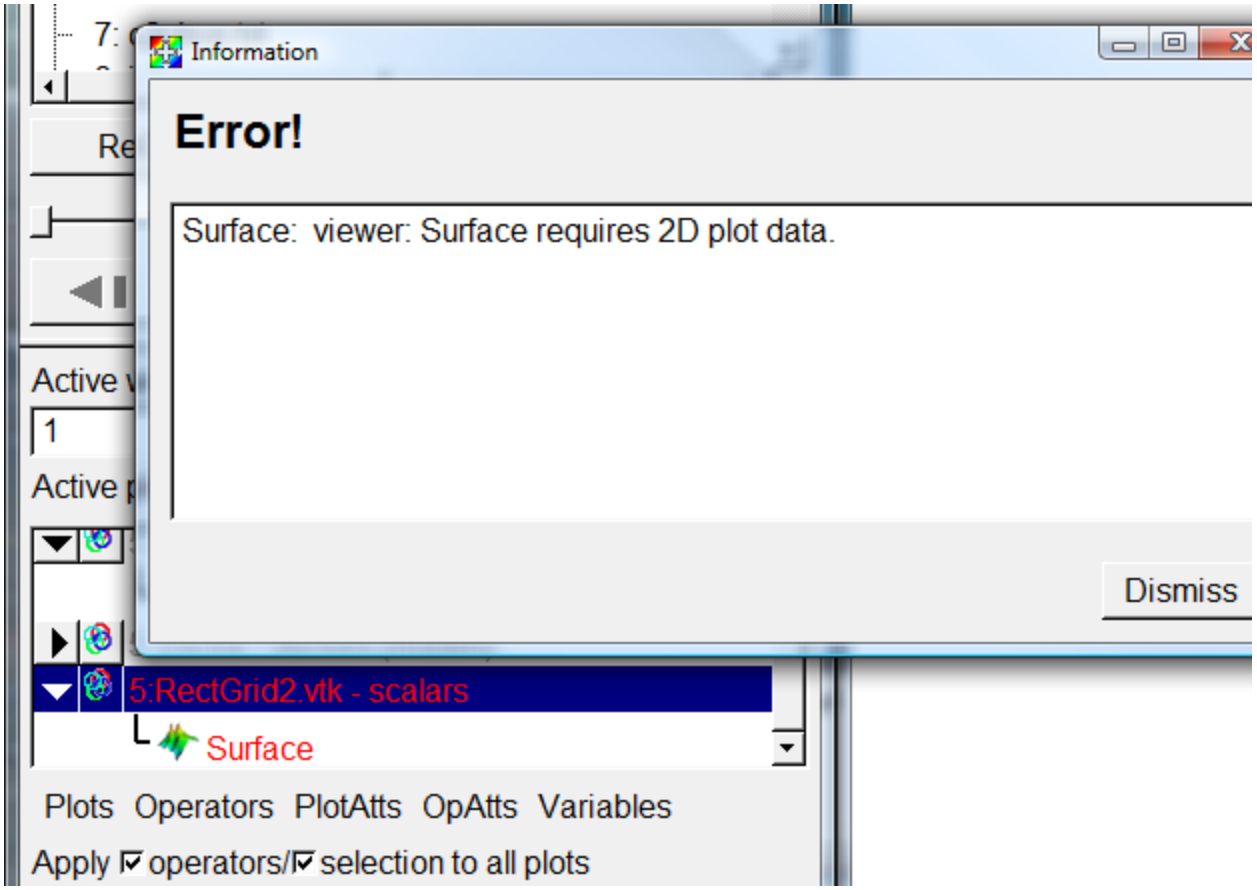
Draw
13:Pseudocolor - vectors_magnitude (hidde
13:Contour - scalars (hidden)
13:Streamline - vectors (hidden)
13:Volume - scalars
Plots Operators PlotAtts OpAtts Variables
Apply operators/selection to all plots
Window 1
DB: RectGrid2.vtk
Cycle: 2
Y-Axis
X-Axis
Z-Axis
user: tg459569
Mon Oct 20 13:02:05 2008

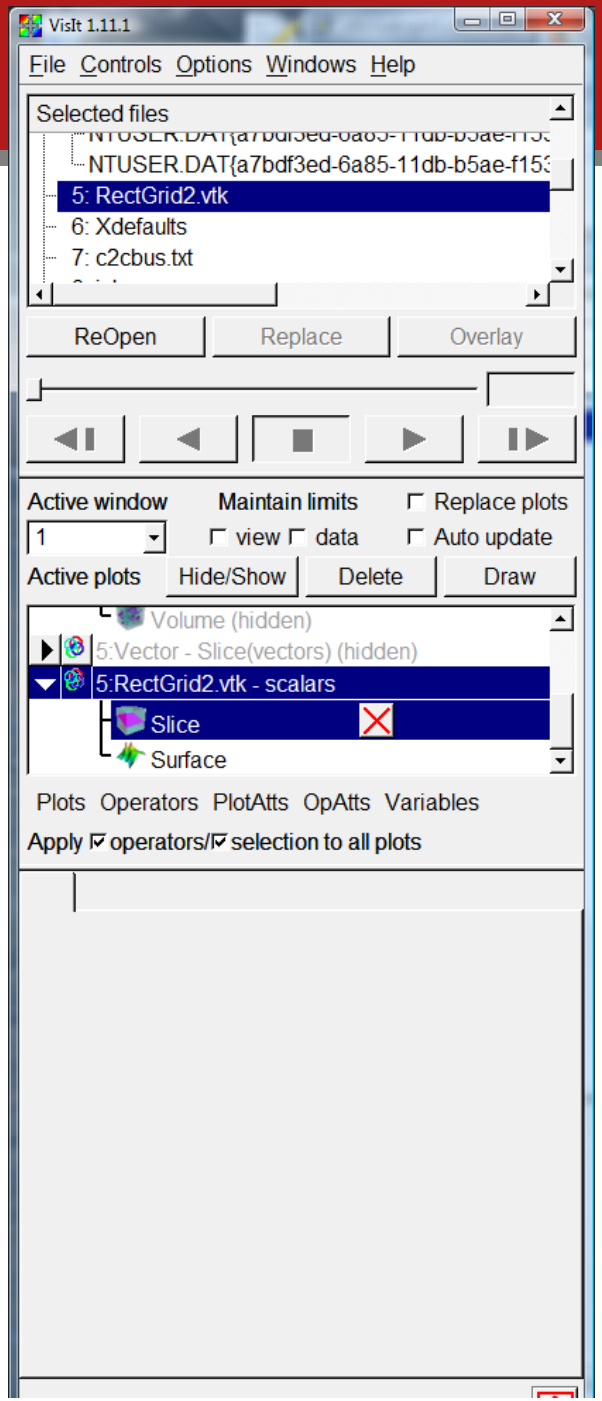
Surface Plot

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

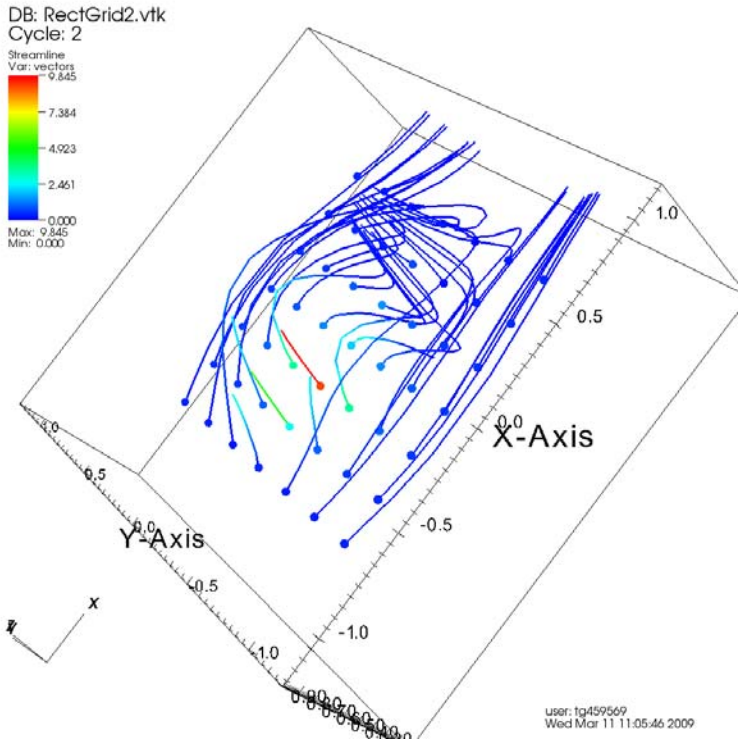


Slice It First

- 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.

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

How to Make Silo

```
import silo
import numpy
import pyublas

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