



TEXAS ADVANCED COMPUTING CENTER

[WWW.TACC.UTEXAS.EDU](http://WWW.TACC.UTEXAS.EDU)



TEXAS

The University of Texas at Austin

# Visit

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# Why are we teaching you VisIT?

- Interactive (GUI) Visualization and Analysis tool
- Multiplatform, Free and Open Source
- The interface looks the same whether you run locally or remotely, serial or in parallel
- Manipulate data or create new data using operators/expressions
- Python scripting interface





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# Getting VisIt

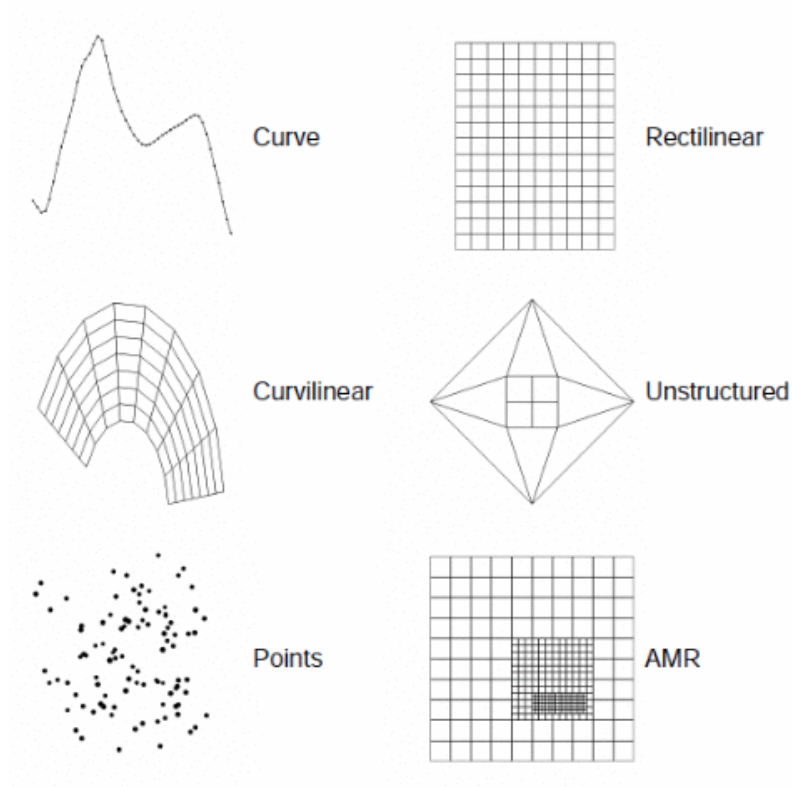
<https://wci.llnl.gov/simulation/computer-codes/visit/>

Binary Distributions

Source Code

Documentation/Tutorials/Sample Data

# Data Types



- Supports a wide variety (over 100) of data types
  - Structured grids
  - Unstructured grids
  - Molecules
  - Polygonal data
  - Images
  - AMR
- Time series support
- Reader plug-ins can be developed for new formats

# Visualization Algorithms

VisIt's visualization capabilities are grouped into two categories:

Plots are used to visualize data and include boundary, contour, label, mesh, pseudocolor, scatter, streamline, and others

Operators consist of operations that can be performed on the data prior to visualization. (Examples include slice, isosurface, threshold among others)





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# VisIt Test-Drive (demo)

Useful reference to VisIT interface and plots:

<https://wci.llnl.gov/simulation/computer-codes/visit/manuals>

# Main Window

Main Menu

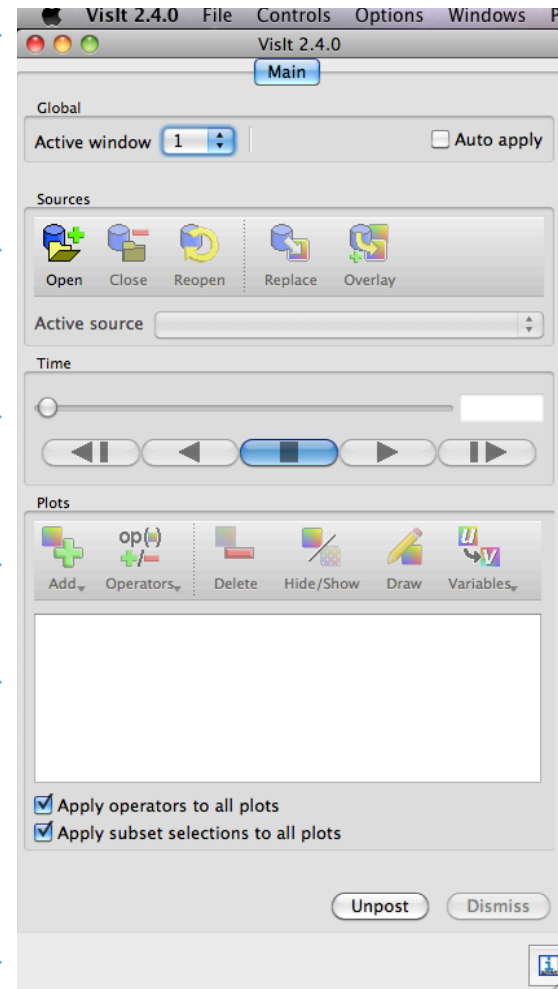
File Controls

Animation Controls

Plot Controls

Active Plot List

Status bar



# Getting Started

Download example data file 'noise.silo'

<https://vis.tacc.utexas.edu/training/>

Right-click, Save link as...

Open VisIt

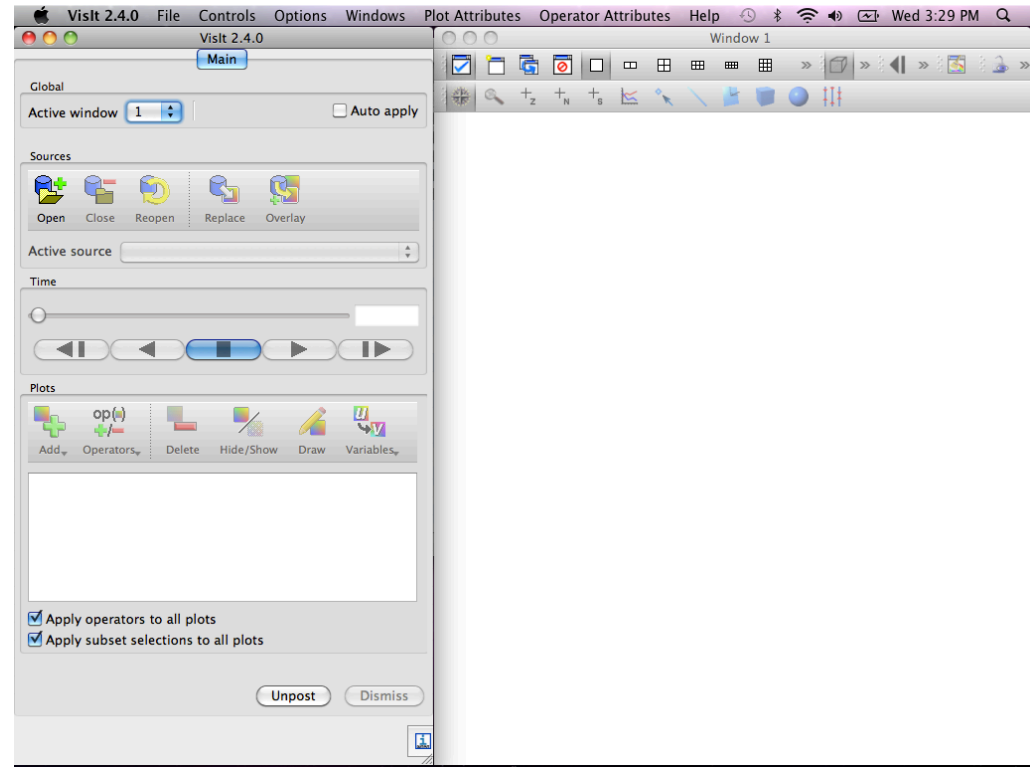




# VisIt

Today we will:

- Create contours for a scalar variable
- Create isosurfaces for a scalar variable
- Clip and slice the isosurfaces
- Use glyphs to display a vector field
- Use streamlines to show flow through a vector field
- Edit annotations and background
- Add slices to show variable values over a plane
- Create volume rendering

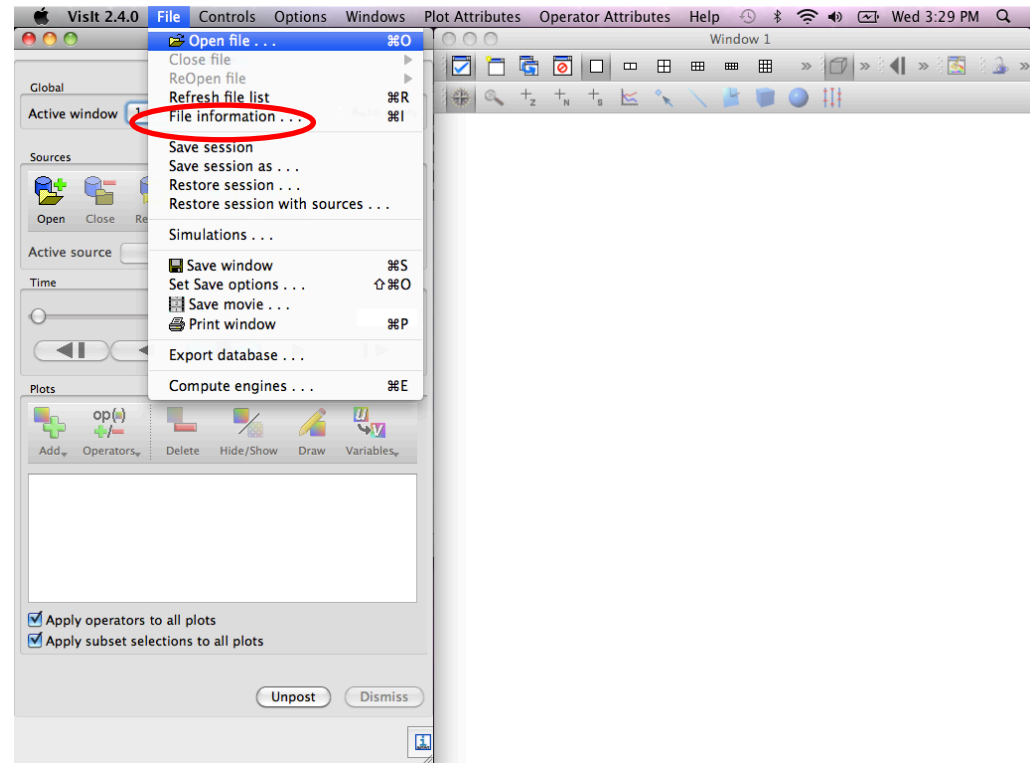


# VisIt

Open the file (and display information)

Noise.silo

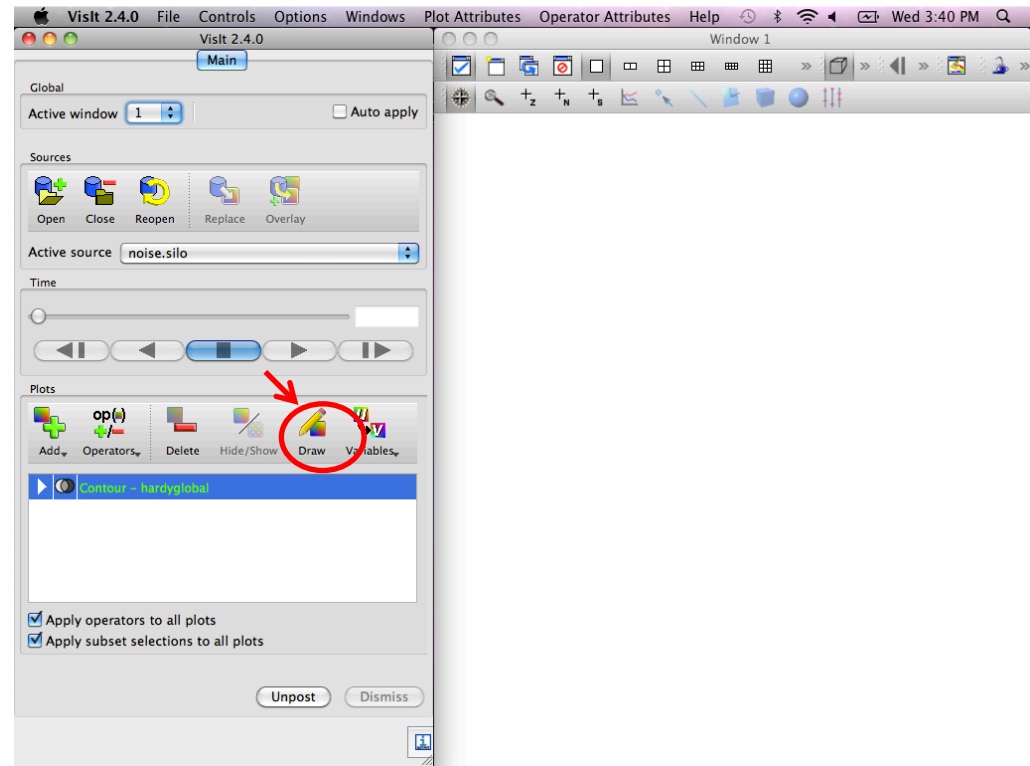
- Click File -> Open file
- Select noise.silo
- Click OK
- Note name of file under -> Active source
- Click File -> File information
- Close Window



# VisIt

## Create contour

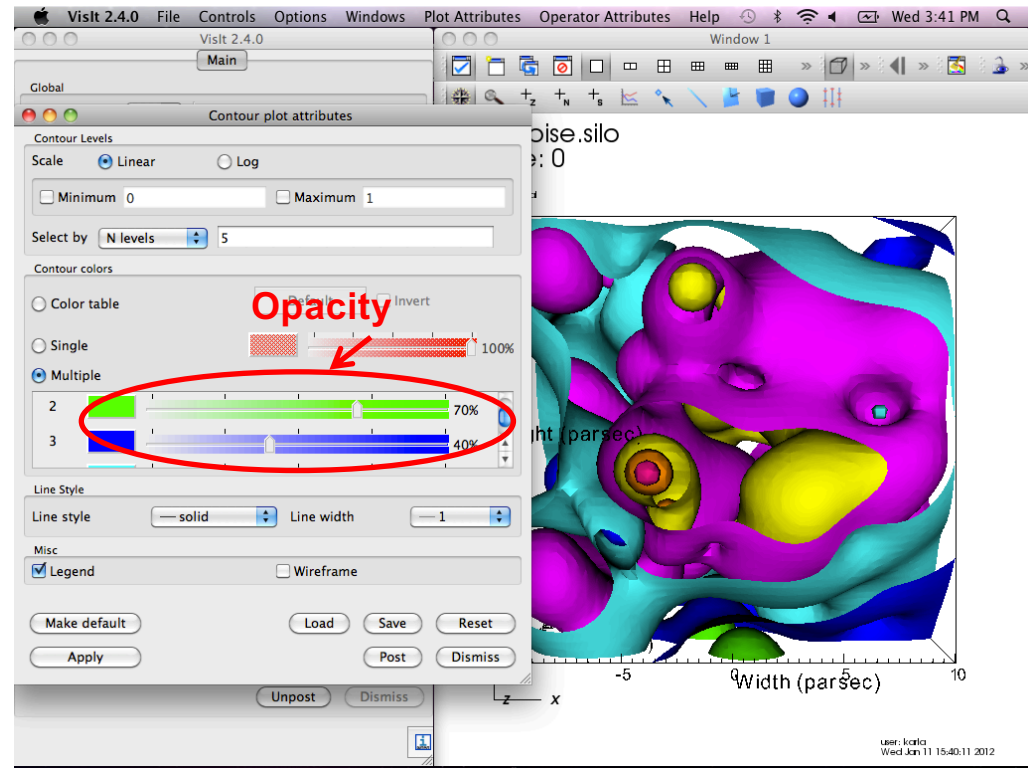
- Click Add -> Contour -> hardyglobal
- Click Draw
- Double click on Contour
- Under select by choose -> N Levels enter 5
- Change the opacity levels
- Click Apply
- Click Dismiss
- Click Delete



# VisIt

## Create contour

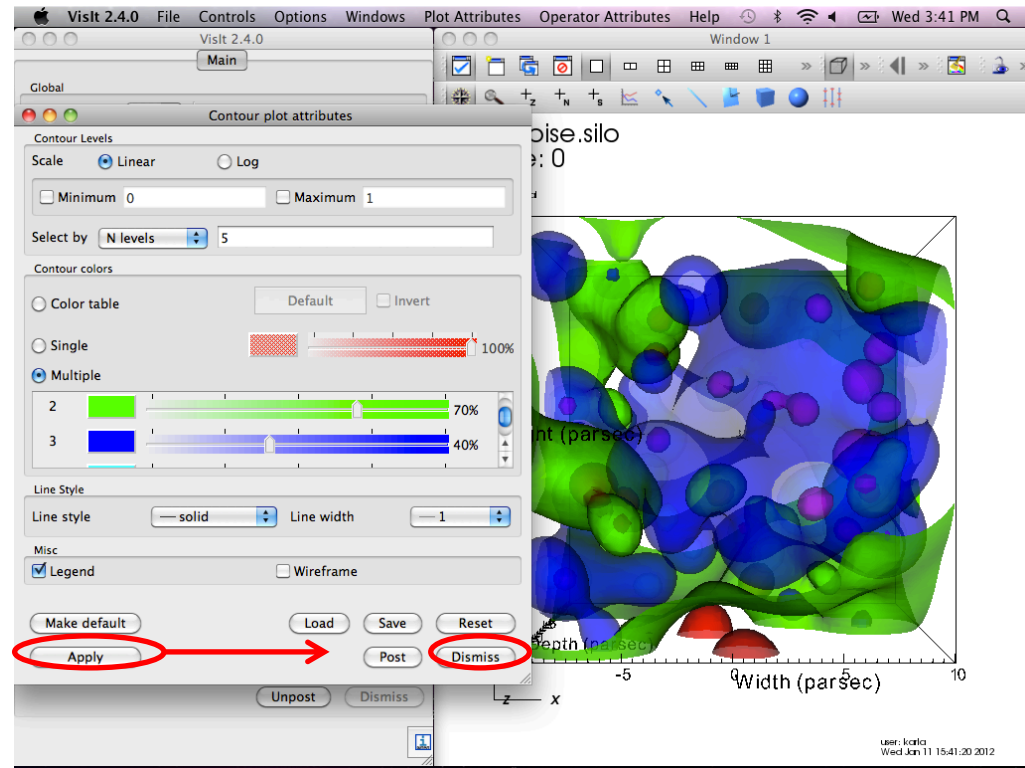
- Click Add -> Contour -> hardyglobal
- Click Draw
- Double click on Contour (or Right-click -> Edit plot description)
- Under select by choose -> N Levels enter 5
- Change the opacity levels
- Click Apply
- Click Dismiss
- Click Delete



# VisIt

## Create contour

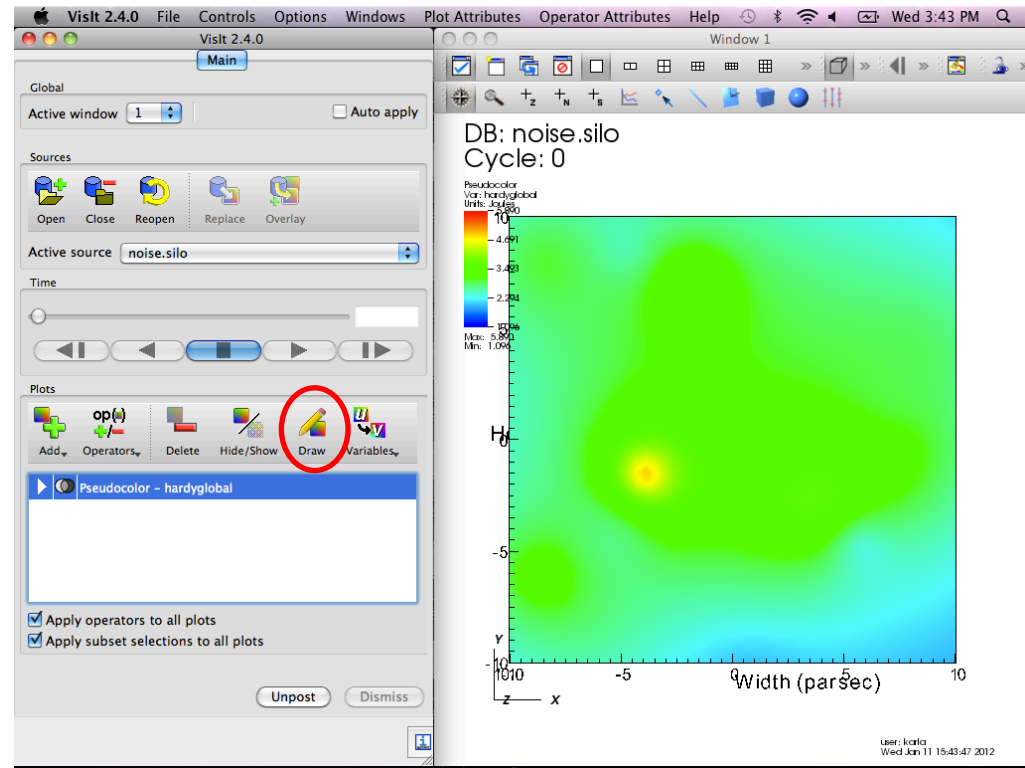
- Click Add -> Contour -> hardyglobal
- Click Draw
- Double click on Contour (or Right-click -> Edit plot description)
- Under select by choose -> N Levels enter 5
- Change the opacity levels
- Click Apply
- Click Dismiss
- Click Delete



# VisIt

## Create Pseudocolor and isosurfaces

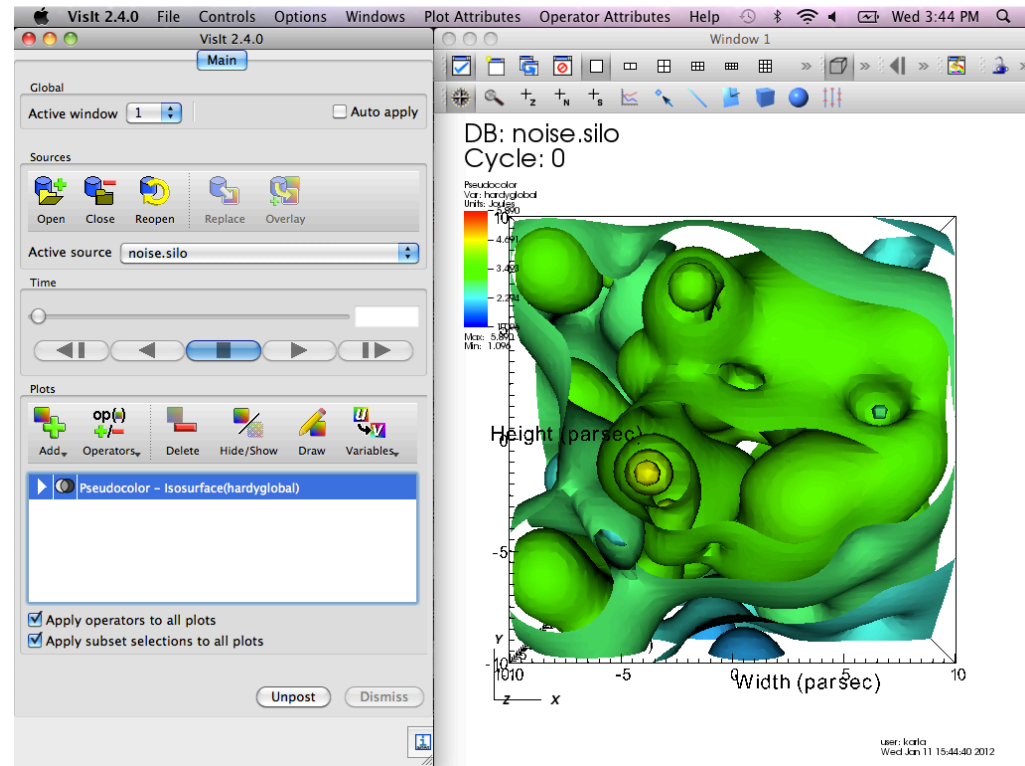
- Click Add -> Pseudocolor -> hardyglobal
- Click Draw
- Click Operator -> Slicing -> Isosurface
- Click Draw
- Click Arrow to expand
- Double-Click Isosurface
- Under select by choose -> Percent (s) enter 50
- Click Apply & Dismiss



# VisIt

## Create Pseudocolor and isosurfaces

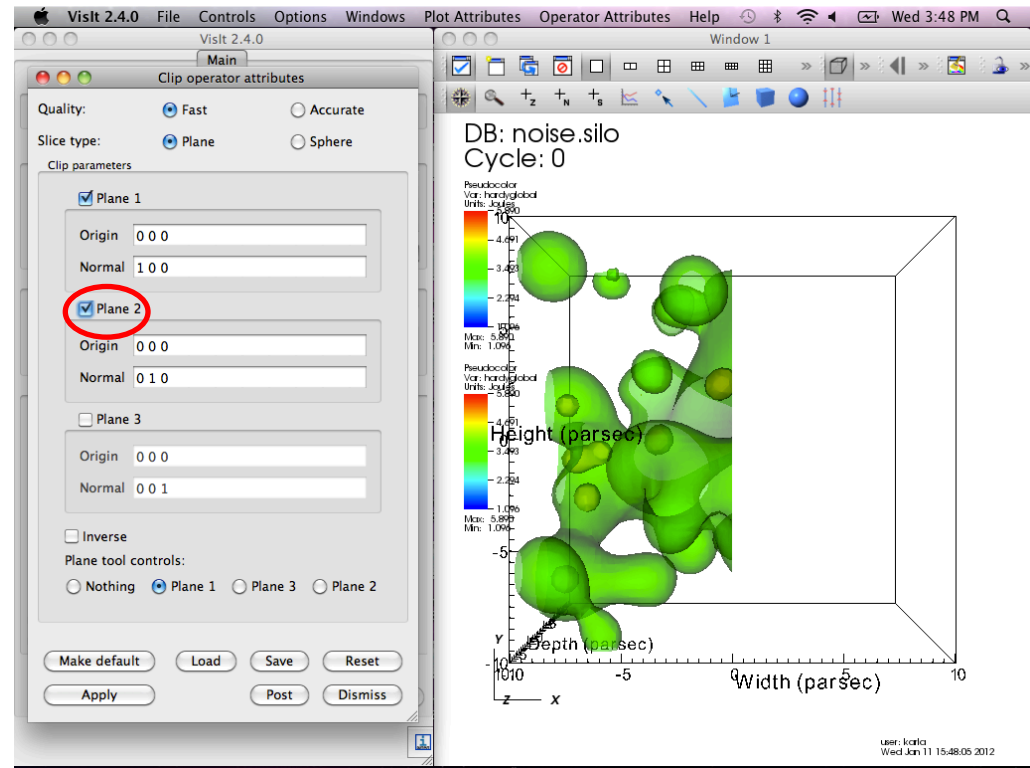
- Click Add -> Pseudocolor -> hardyglobal
- Click Draw
- Click Operator -> Slicing -> Isosurface
- Click Draw
- Click Arrow to expand
- Double-Click Isosurface
- Under select by choose -> Percent (s) enter 50
- Click Apply & Dismiss



# VisIt

## Clip Isosurfaces

- **Select** -> apply operators and selection to all plots
- **Click Operators** -> Selection -> Clip
- **Click Draw**
- **Double-Click** -> Clip
- **Click Plane 2**
- **Click Apply & Dismiss**
- **Click x** (to delete)
- **Click Draw**

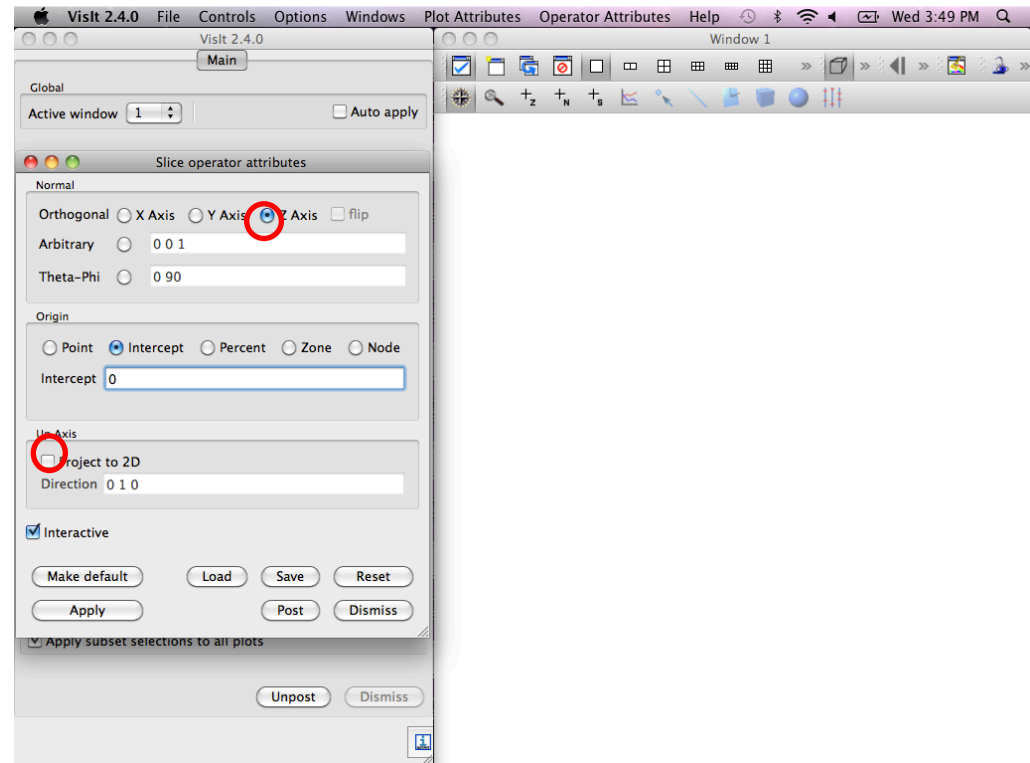




# VisIt

## Slice Isosurfaces

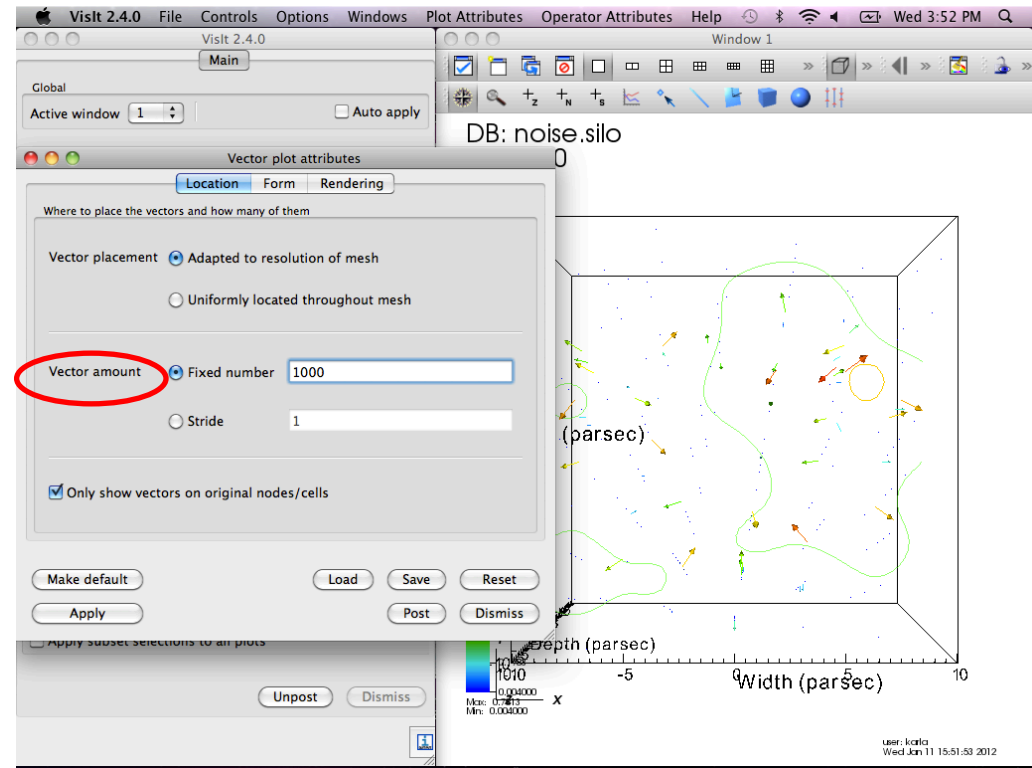
- Click Operators -> Slicing -> Slice
- Double-Click -> Slice
- Select Z-Axis & Unselect Project to 2D
- Click Apply
- Click Dismiss
- Click Draw



# VisIt

## Create Glyph of Vector

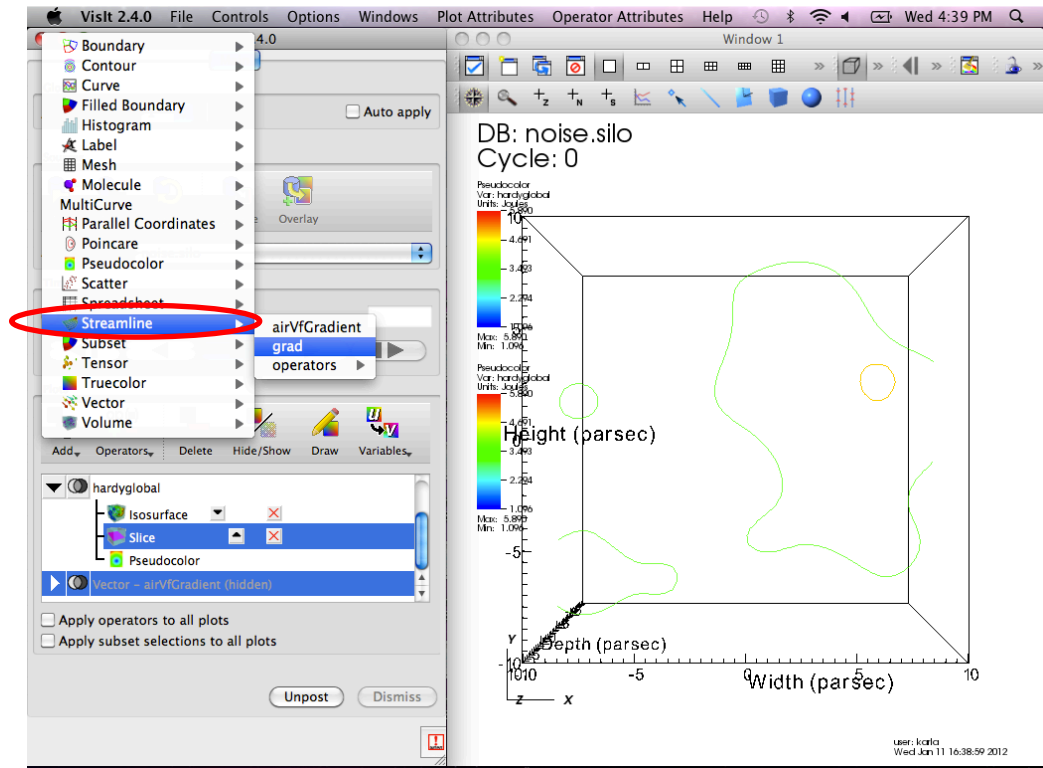
- **Unselect** Apply operators/ selection to all plots
- **Click** Add -> Vector -> airVfGradient
- **Click** Draw
- **Double click** on Vector
- **Under** Vector amount enter 1000
- **Click** Apply
- **Click** Dismiss
- **Click** Hide/Show



# VisIt

## Create Streamlines

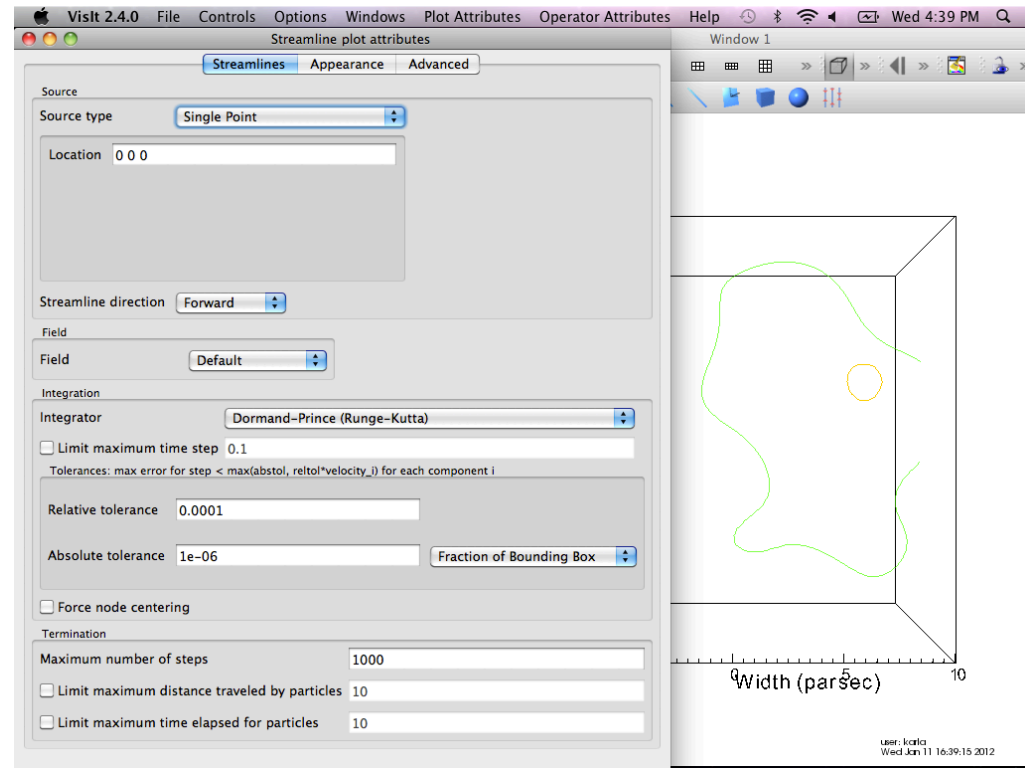
- Click Add -> Streamline -> grad
- Double click on Streamline
- Under Source Type Select Plane Enter:
  - Samples in X and Y: 15
  - Distance in X and Y: 20
  - Streamline Direction Both
  - Select limit Maximum Time Step
- Click Apply
- Click Dismiss
- Click Draw and Dismiss warning
- Double click on Streamline



# VisIt

## Create Streamlines

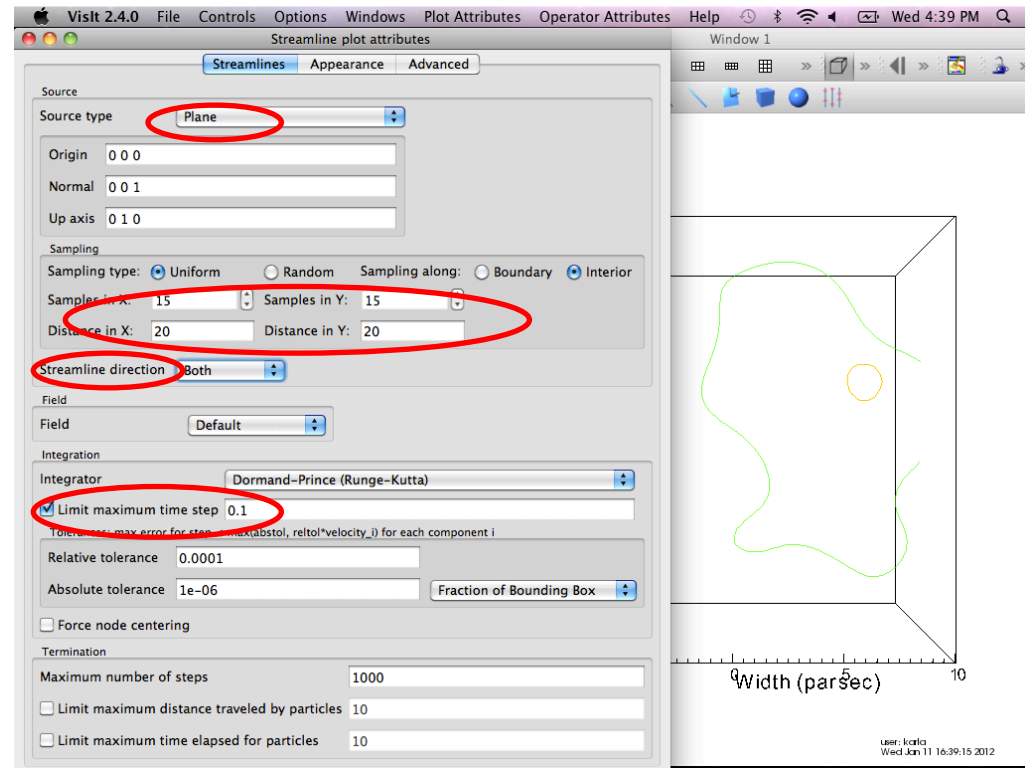
- Click Add -> Streamline -> grad
- Double click on Streamline
- Under Source Type Select Plane Enter:
  - Samples in X and Y: 15
  - Distance in X and Y: 20
  - Streamline Direction Both
  - Select limit Maximum Time Step
- Click Apply
- Click Dismiss
- Click Draw and Dismiss warning
- Double click on Streamline



# VisIt

## Create Streamlines

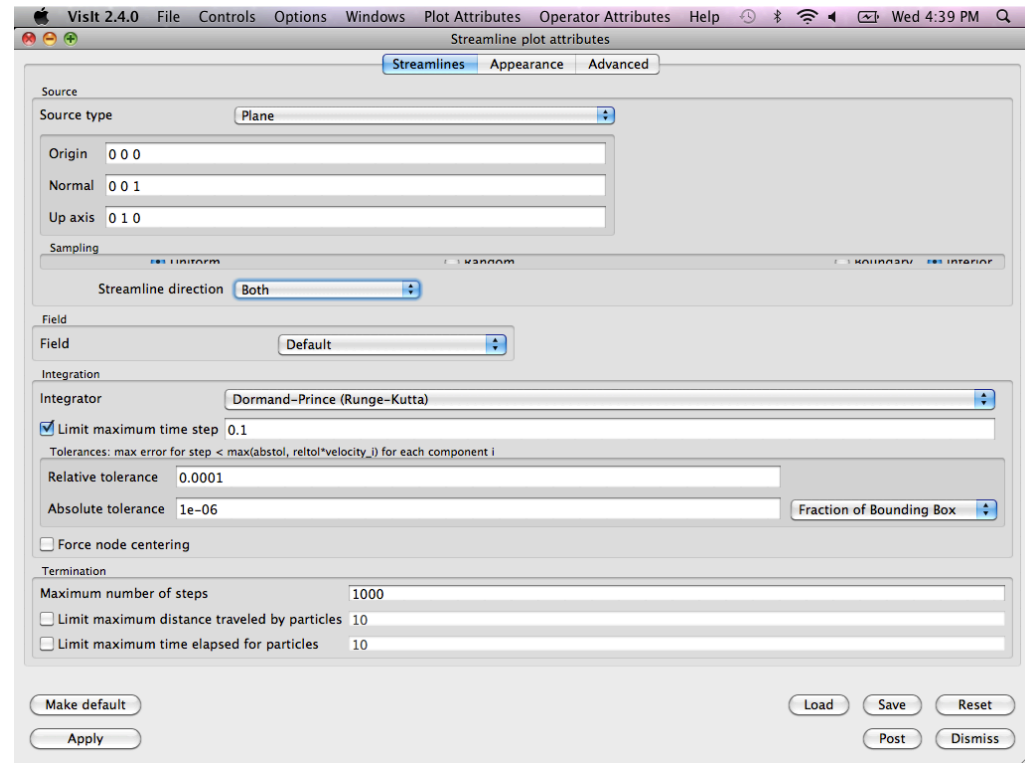
- Click Add -> Streamline -> grad
- Double click on Streamline
- Under Source Type Select Plane
- Enter:
  - Samples in X and Y: 15
  - Distance in X and Y: 20
  - Streamline Direction Both
  - Select limit Maximum Time Step
- Click Apply
- Click Dismiss
- Click Draw and Dismiss warning
- Double click on Streamline



# VisIt

## Create Streamlines

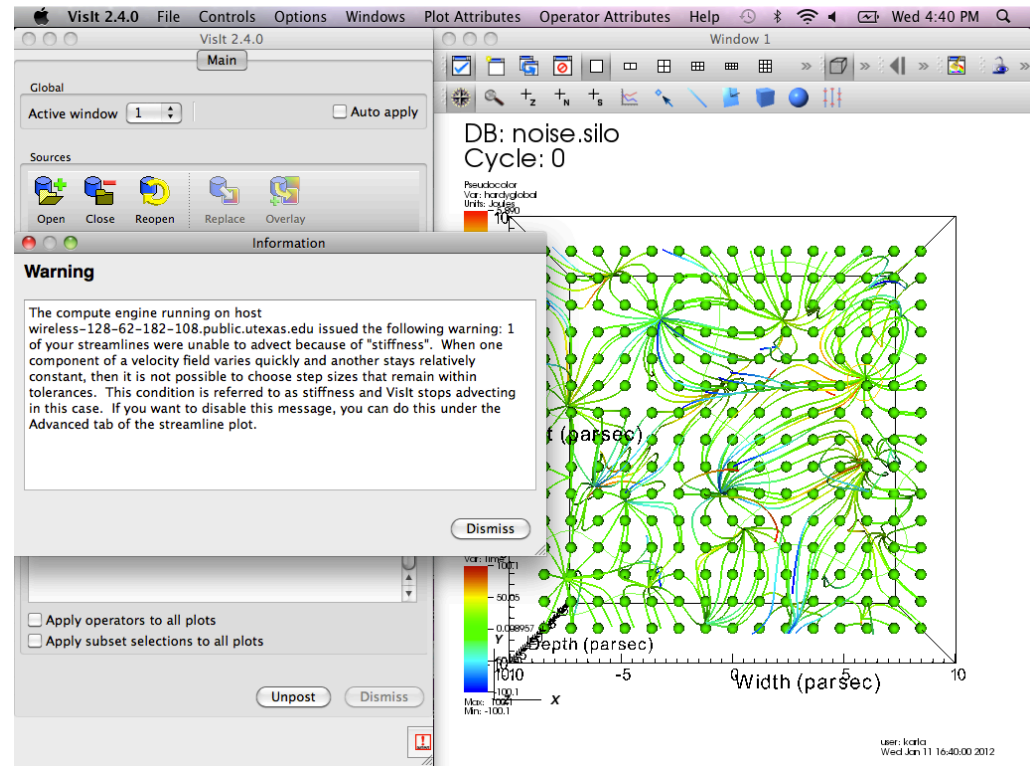
- Click Add -> Streamline -> grad
- Double click on Streamline
- Under Source Type Select Plane
- Enter:
  - Samples in X and Y: 15
  - Distance in X and Y: 20
  - Streamline Direction Both
  - Select limit Maximum Time Step
- Click Apply
- Click Dismiss
- Click Draw and Dismiss warning
- Double click on Streamline



# VisIt

## Create Streamlines

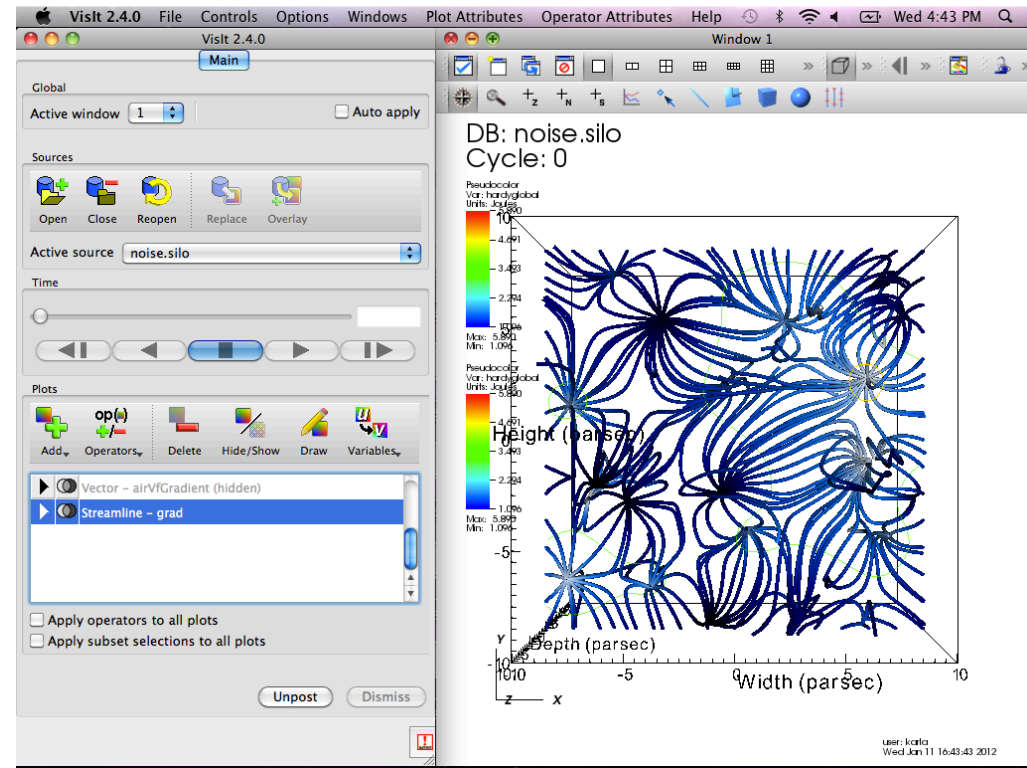
- Click Add -> Streamline -> grad
- Double click on Streamline
- Under Source Type Select Plane
- Enter:
  - Samples in X and Y: 15
  - Distance in X and Y: 20
  - Streamline Direction Both
  - Select limit Maximum Time Step
- Click Apply
- Click Dismiss
- Click Draw and Dismiss warning
- Double click on Streamline



# VisIt

## Create Streamlines

- Click on Appearance
- Under Draw as select Tubes -  
> Radius 0.005
- Unselect Show seeds
- Unselect Legend
- Click Apply
- Under Data Value select  
Variable -> Scalars ->  
hardyglobal
- Click Apply (dismiss  
warning)
- Under Color -> Color table, click  
Default Choose bluehot
- Click Apply & Dismiss

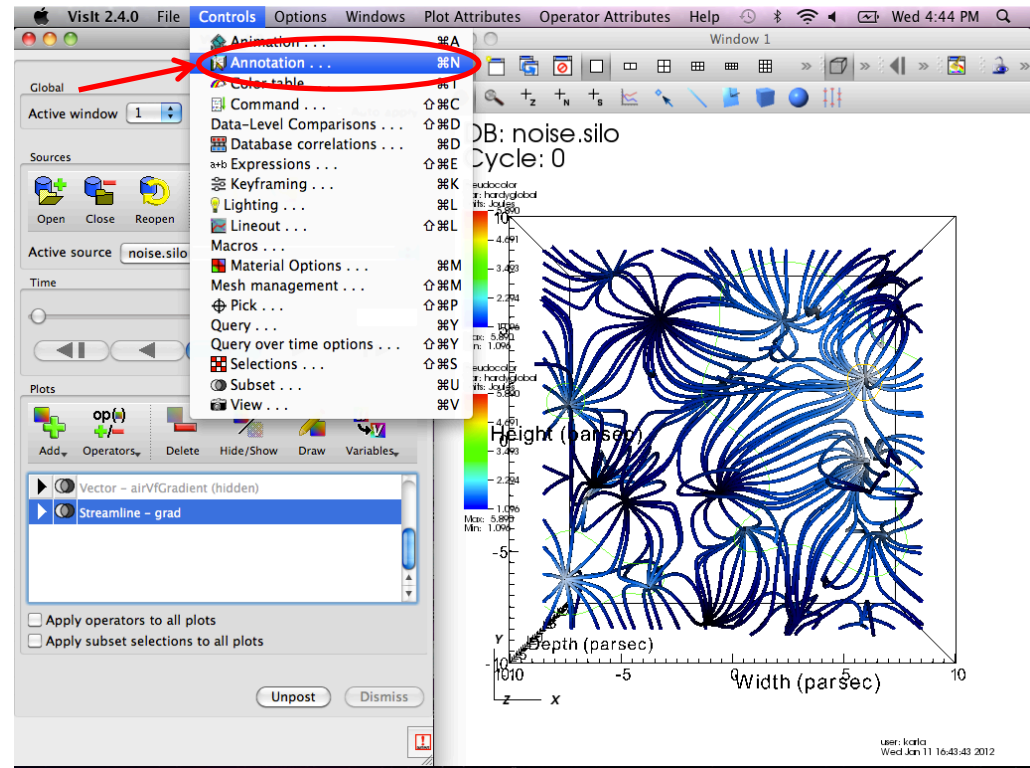




# VisIt

## Background Color and Legend

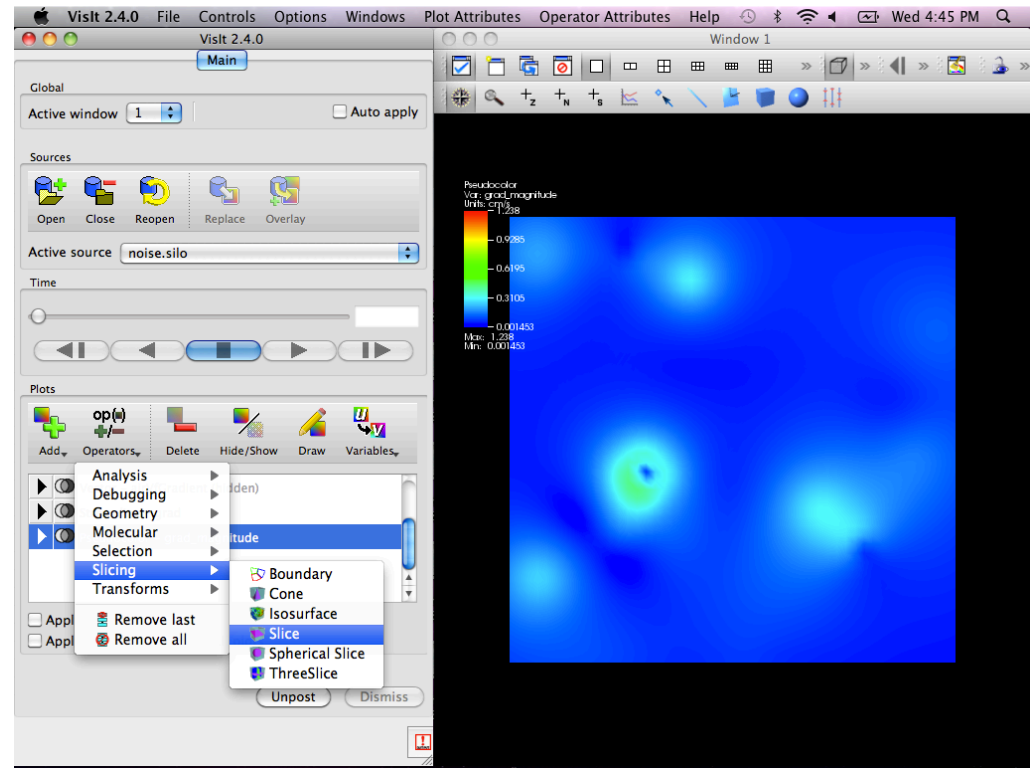
- Click on Controls -> Annotation
- Click on Colors
- Select Black for Background and White for Foreground
- Click on General
- Click no annotations
- Select legend
- Click Apply & Dismiss
- Hide Pseudocolor Plots



# VisIt

## Create Slice

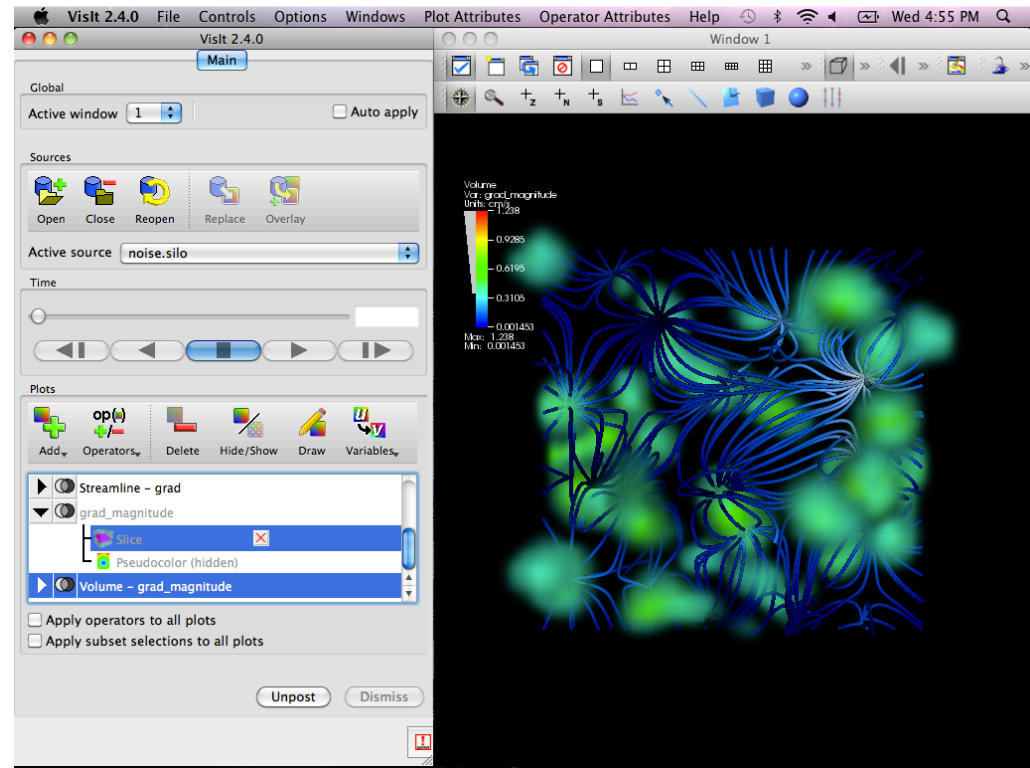
- Click Add -> Pseudocolor -> grad\_magnitude
- Click Draw
- Click Operator -> Slicing -> Slice
- Double click on Slice
- Select Z Axis
- Unselect project to 2D
- Click Apply & Dismiss
- Click Draw
- Click Hide/Show

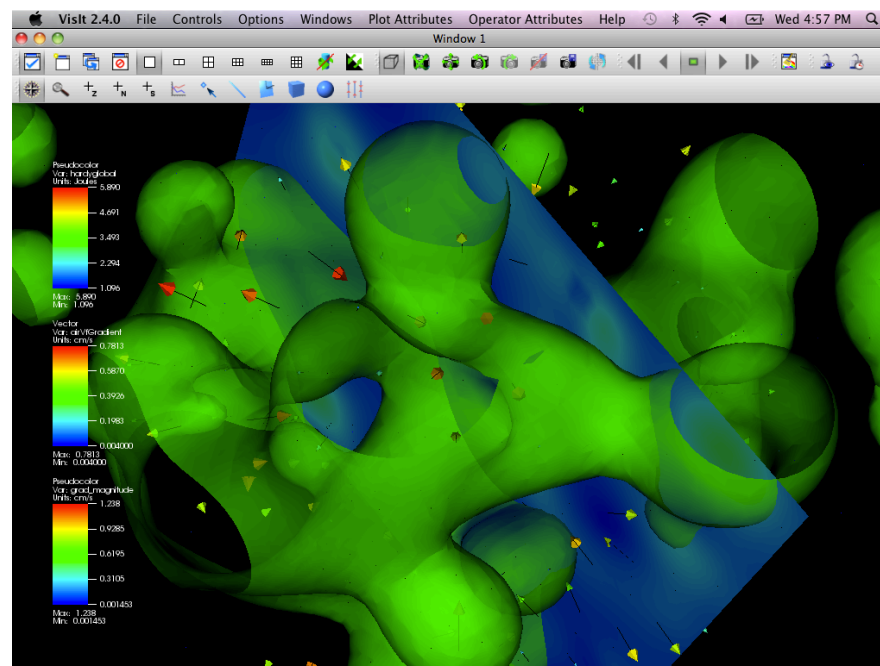
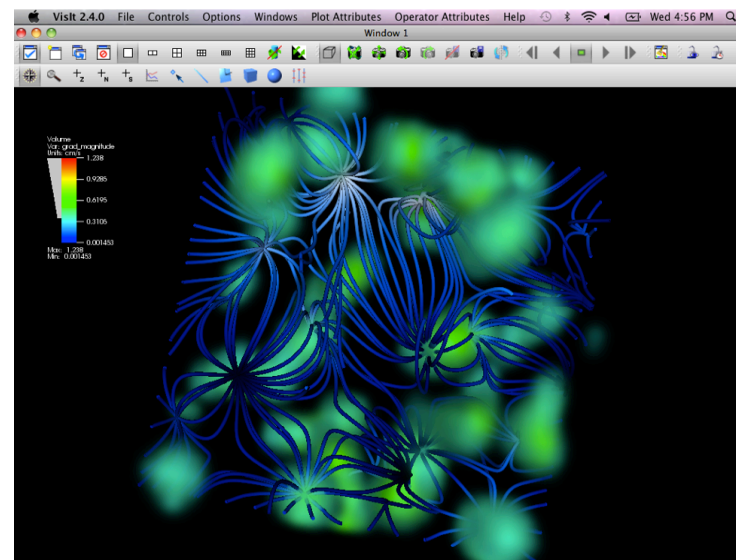
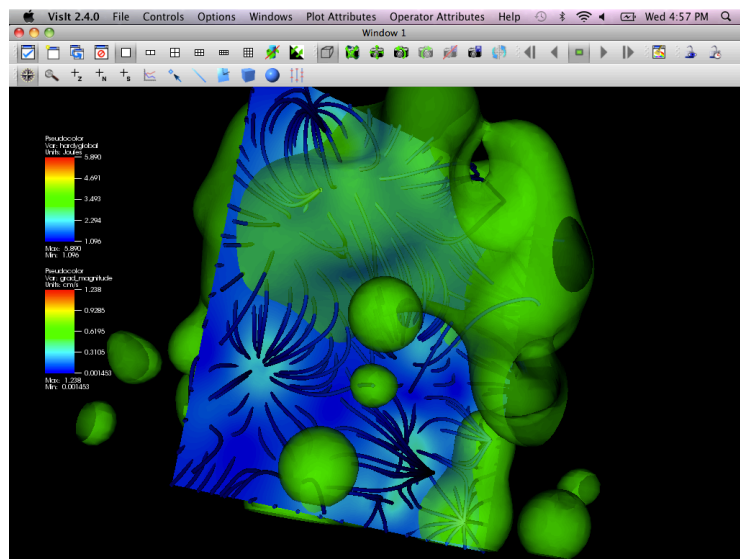


# VisIt

## Create Volume Rendering

- Click Add -> Volume -> grad\_magnitude
- Click Draw
- Double click on Volume
- Click on 1D transfer function
- Change Transfer Function (Under Opacity)
- Click Apply
- Click Dismiss





# movie rendering from a session file

File->"Save Movie"

"New Simple movie"

Format "TIFF images" "MPEG"

"Now, use currently allocated processes"

and..."Later, tell me the command to run"

Cut and paste this command into a qsub or slurm script

# Python “trace” good way to learn

VisIT CLI or Command window

Controls->“Launch CLI” or “Command”  
and hit “Record”

OR

Paraview “Tools->Python Shell”

“Tools->Start Trace” and “Stop Trace”

# Commands->Record

(close noise.silo)

Controls->Command

Hit "Record"

Open File, Add->Pseudocolor->Hardyglobal

File->SaveWindow

Hit "Stop"

Can copy and paste into a python script, e.g.

Run by executing "visit -cli -s script.py"

For VisIT good link for getting started  
<https://wci.llnl.gov/simulation/computer-codes/visit/manuals>



# Questions?

- More tutorials available:

- <https://wci.llnl.gov/simulation/computer-codes/visit/manuals>

- More information:

- [www.visitusers.org](http://www.visitusers.org)

- More help:

- Visit User mailing list: [visit-users@email.ornl.gov](mailto:visit-users@email.ornl.gov)



