



IEEE Vis ParaView Tutorial

October 13, 2009

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
for the United States Department of Energy's National Nuclear Security Administration
under contract DE-AC04-94AL85000.





Agenda

8:30	What's New	Kenneth Moreland
8:40	Customizing ParaView with Plugins	Kenneth Moreland
10:15	<i>Break</i>	
10:30	Python Scripting	David DeMarle
12:15	<i>Lunch</i>	
2:00	Petascale Distance Visualization	Jonathan Woodring
3:00	<i>In-Situ</i> Visualization: Integration	David Thompson
3:45	<i>Break</i>	
4:15	<i>In-Situ</i> Visualization: Bridging	Nathan Fabian
4:45	Statistics	Philippe Pebay



Tutorial Rules

- **Ask Questions**
- **Fill Out Comment Form**
- **Watch Some If You Cannot Watch It All**



Obligatory Funding and Contributors Slide



Sandia
National
Laboratories



Swiss National
Supercomputing
Centre

- Army SBIR
- ERDC Contract
- US NSF SBIR
- Support Contracts
 - Electricity de France
 - Mirarco
 - Oil Industry



What's New

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Python API

Old Script

```
from paraview import servermanager

if not servermanager.ActiveConnection:
    servermanager.Connect()
pm = servermanager.ProxyManager()

if len(pm.GetProxiesInGroup("views")) > 0:
    view = pm.GetProxiesInGroup("views").values()[0]
else:
    view = servermanager.CreateRenderView()

sphere = servermanager.sources.SphereSource()
sphere.ThetaResolution = 36
sphere.PhiResolution = 36
pm.RegisterProxy("sources", "sphere", sphere)

elevation = servermanager.filters.ElevationFilter(Input=sphere)
elevation.LowPoint = [-0.5, 0.0, 0.0]
elevation.HighPoint = [0.5, 0.0, 0.0]
pm.RegisterProxy("sources", "elevation", elevation)

elevrep = servermanager.CreateRepresentation(elevation, view)
pm.RegisterProxy("representations", "elevrep", elevrep)
lt = servermanager.rendering.PVLookupTable()
lt.RGBPoints = [0, 0, 0, 1, 1, 1, 0] # Blue to Red
lt.ColorSpace = 1 # HSV
elevrep.LookupTable = lt
elevrep.ColorAttributeType = 0 # point data
elevrep.ColorArrayName = "Elevation"

view.ResetCamera()
view.StillRender()
```

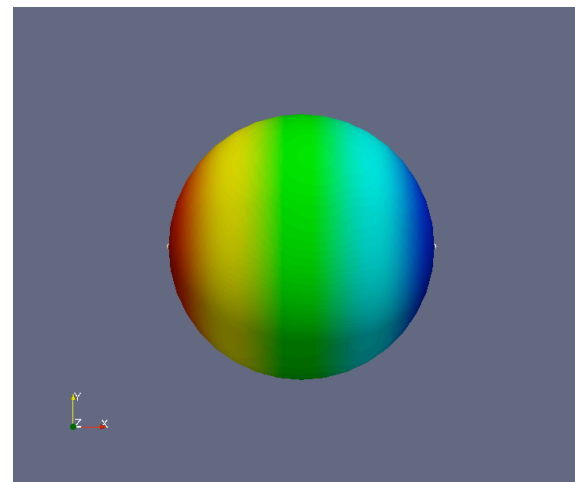
New Script

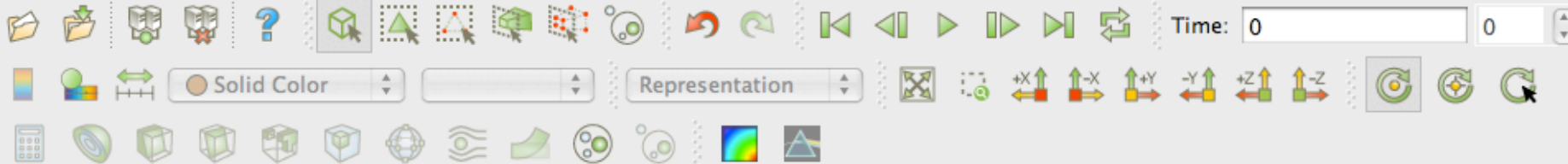
```
from paraview.simple import *

sphere = Sphere()
sphere.ThetaResolution = 36
sphere.PhiResolution = 36

elevation = Elevation()
elevation.LowPoint = [-0.5, 0.0, 0.0]
elevation.HighPoint = [0.5, 0.0, 0.0]
SetDisplayProperties(ColorArrayName = "Elevation")
Show()

Render()
```





Pipeline Browser

builtin:
points.csv
TableToPoints1
Glyph2

Showing **points.csv** Attribute: **Row Data** Precision: **6**

	Radius	x	y	z	Row ID
0	0.70581	1.69715	1.06315	0.176519	0
1	0.658992	-0.846007	-0.928486	-0.472322	1
2	0.430791	-2.58414	-1.66631	-0.0441292	2
3	0.481172	-0.905612	0.513356	0.28491	3
4	0.652226	2.15247	0.981106	0.576655	4
5	0.671747	-1.09699	-0.482583	-0.623081	5

Object Inspector

Properties Display Information

Apply Reset Delete ?

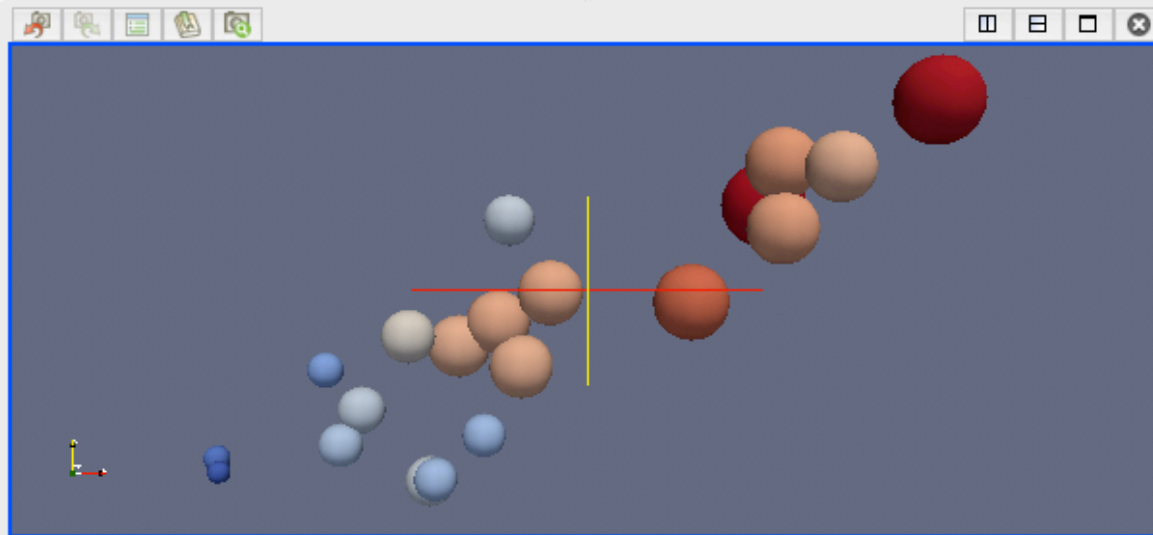
- ☒ Detect Numeric Columns
- ☒ Use String Delimiter
- ☒ Have Headers

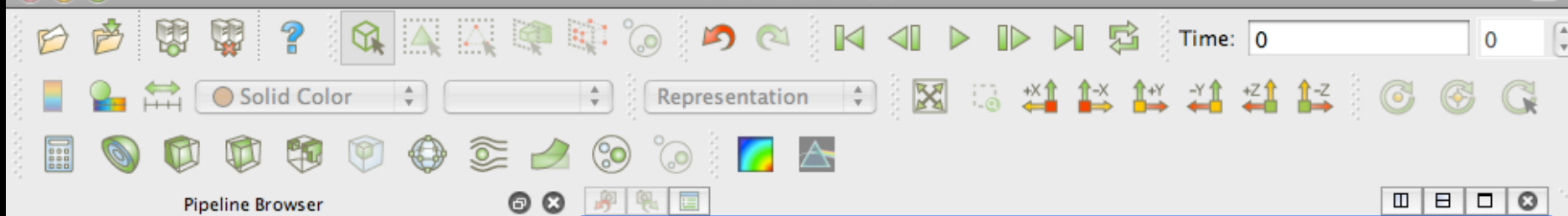
Field

Delimiter

Characters

,





Object Inspector

Properties | **Display** | Information

☐ Velocity (1)	☐ Velocity (2)	☐ Velocity (Magnit...)	☐ Vorticity (0)	☐ Vorticity (1)	☐ Vorticity (2)	☒ Vorticity (Magnit...)
☐ Velocity (1)	☐ Velocity (2)	☐ Velocity (Magnit...)	☐ Vorticity (0)	☐ Vorticity (1)	☐ Vorticity (2)	☒ Vorticity (Magnit...)

☒ Enable Line Series

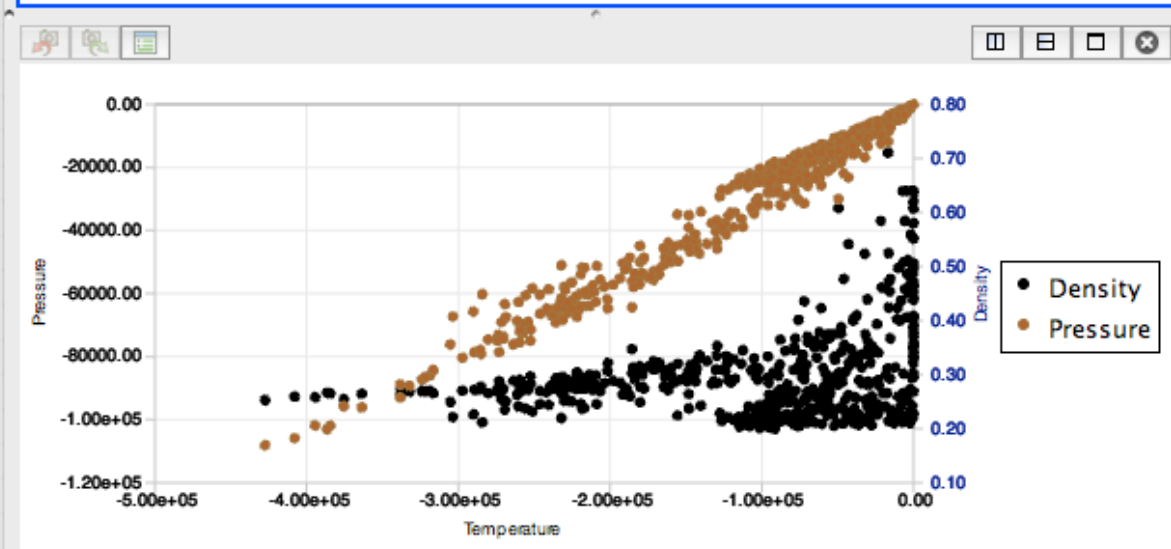
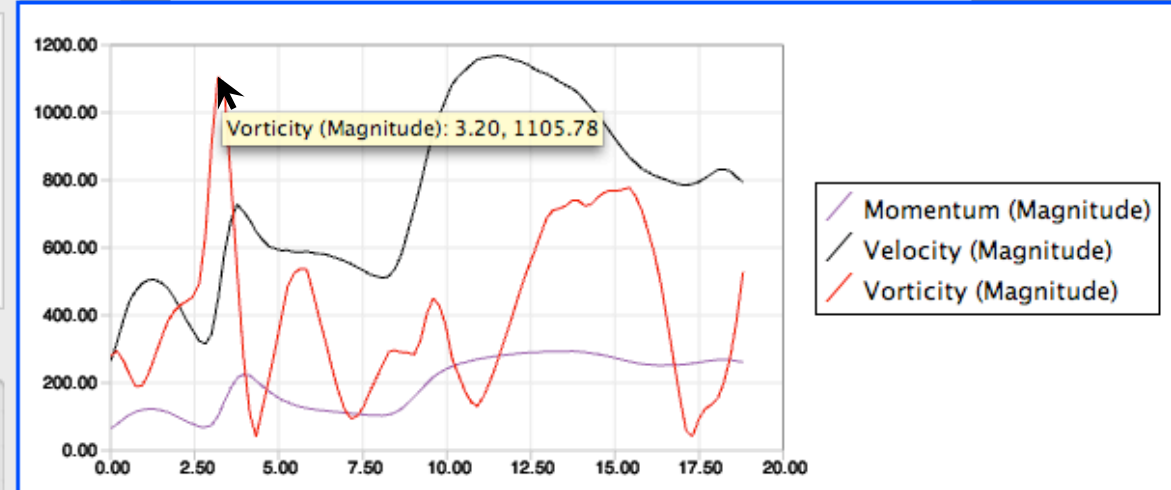
Line Color: ● Choose Color

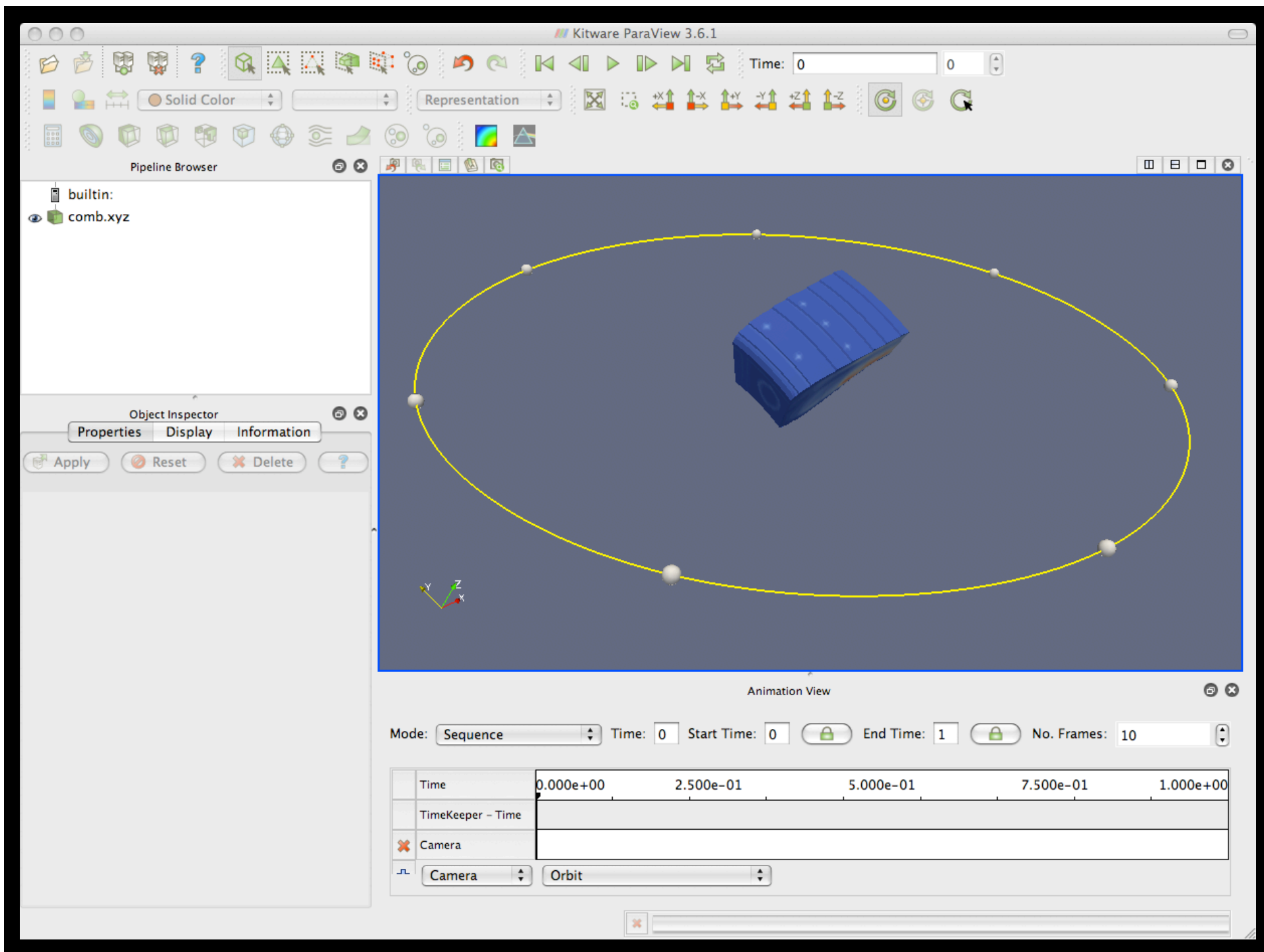
Line Thickness: 1

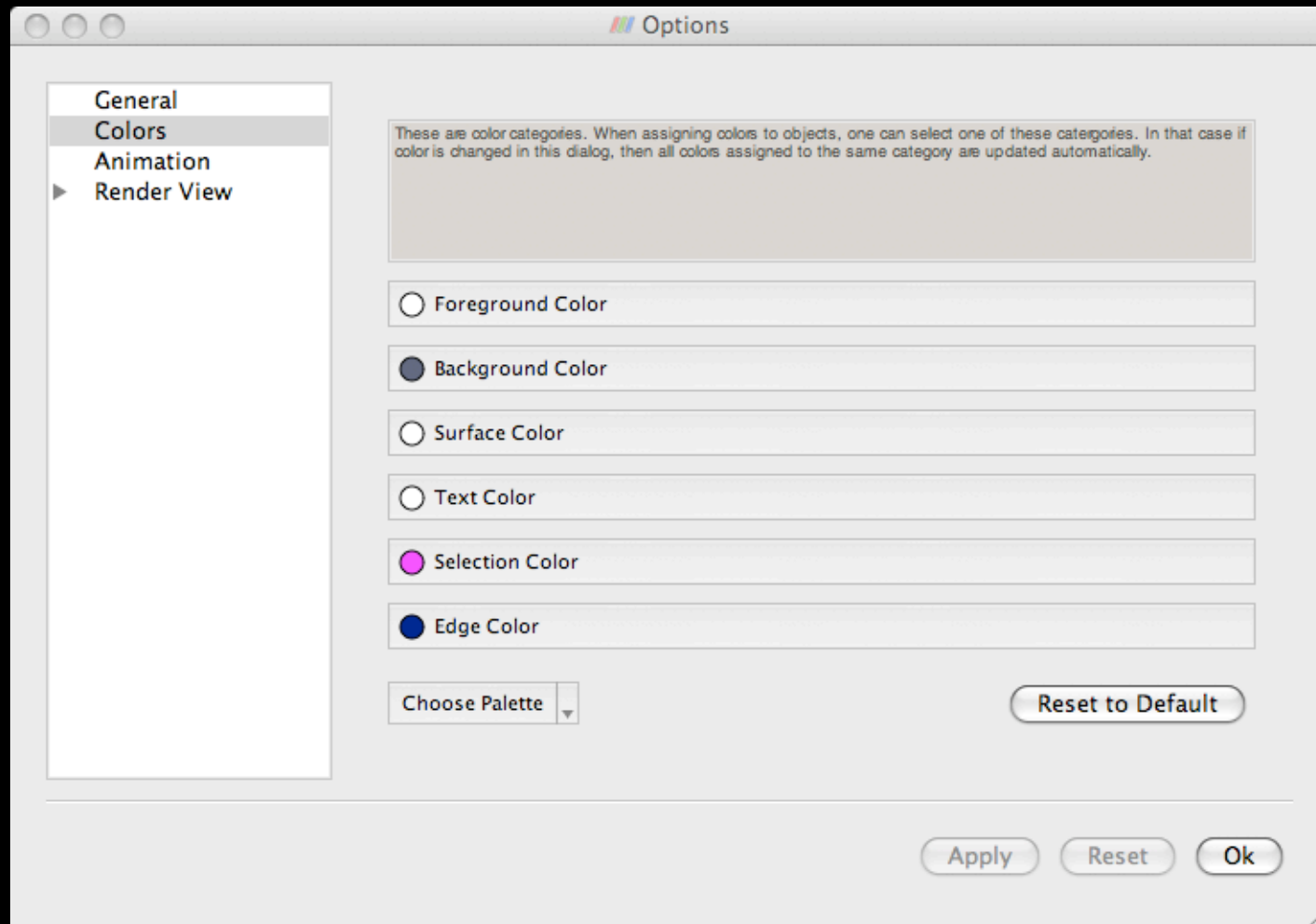
Line Style: Solid

Marker Style: None

Chart Axes: Bottom-Left









Pipeline Browser

builtin:
Mandelbrot1

Object Inspector

Properties Display Information

View

☒ Visible

Zoom To Data

☒ Selectable

Color

☐ Interpolate Scalars

☒ Map Scalars

Apply Texture None

Color by

Iterations

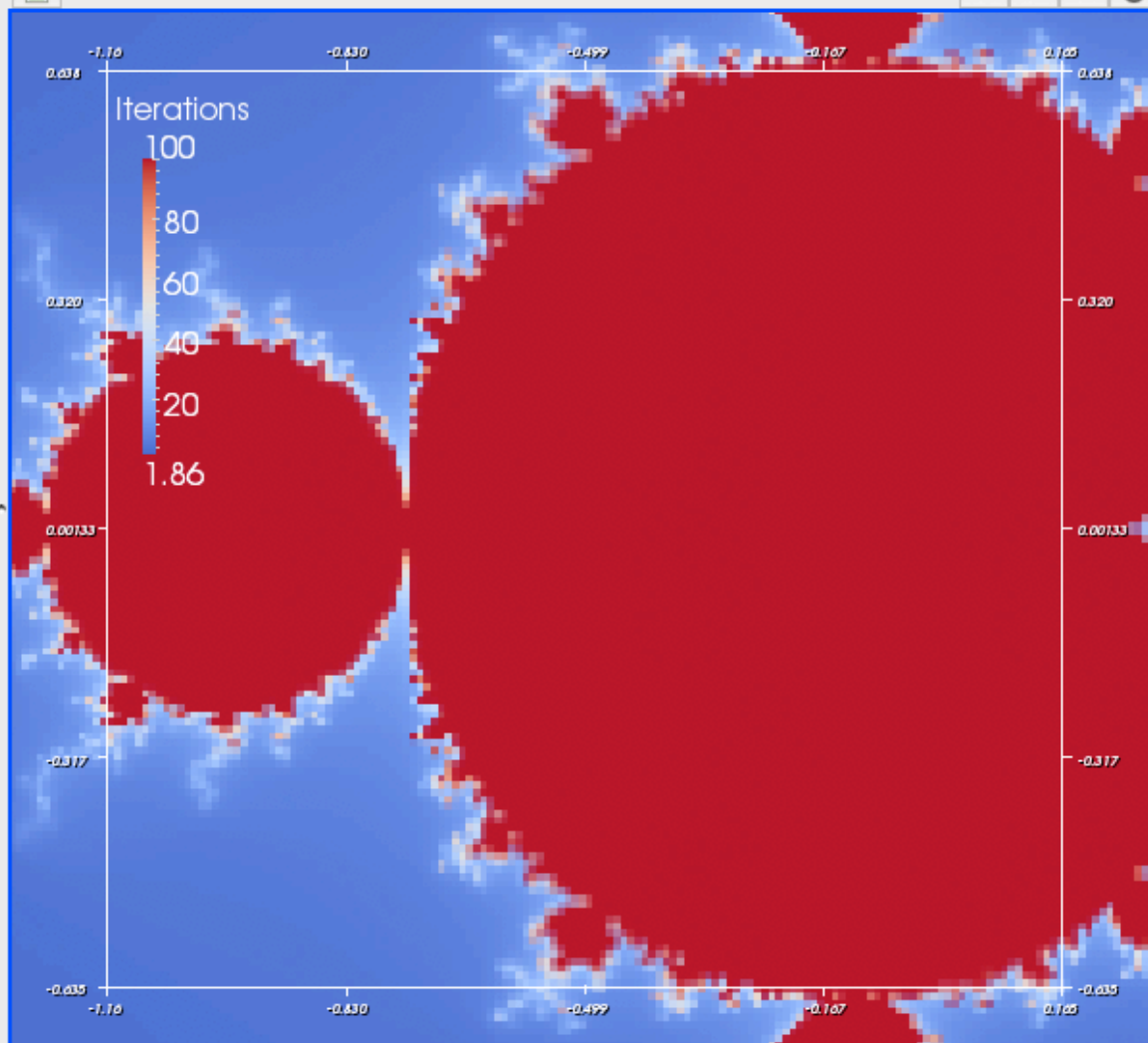
Edit Color Map...

Rescale to Data Range

Slice

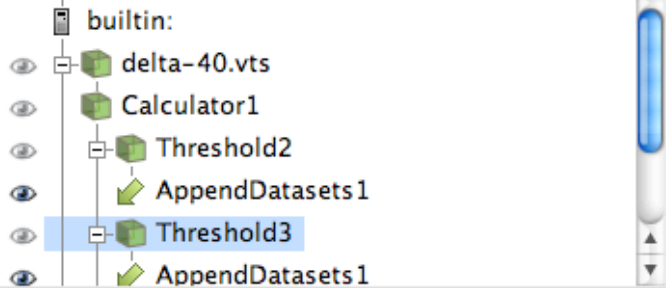
Slice Direction

XY Plane



Time: 0 0

Pipeline Browser



Object Inspector

Properties Display Information

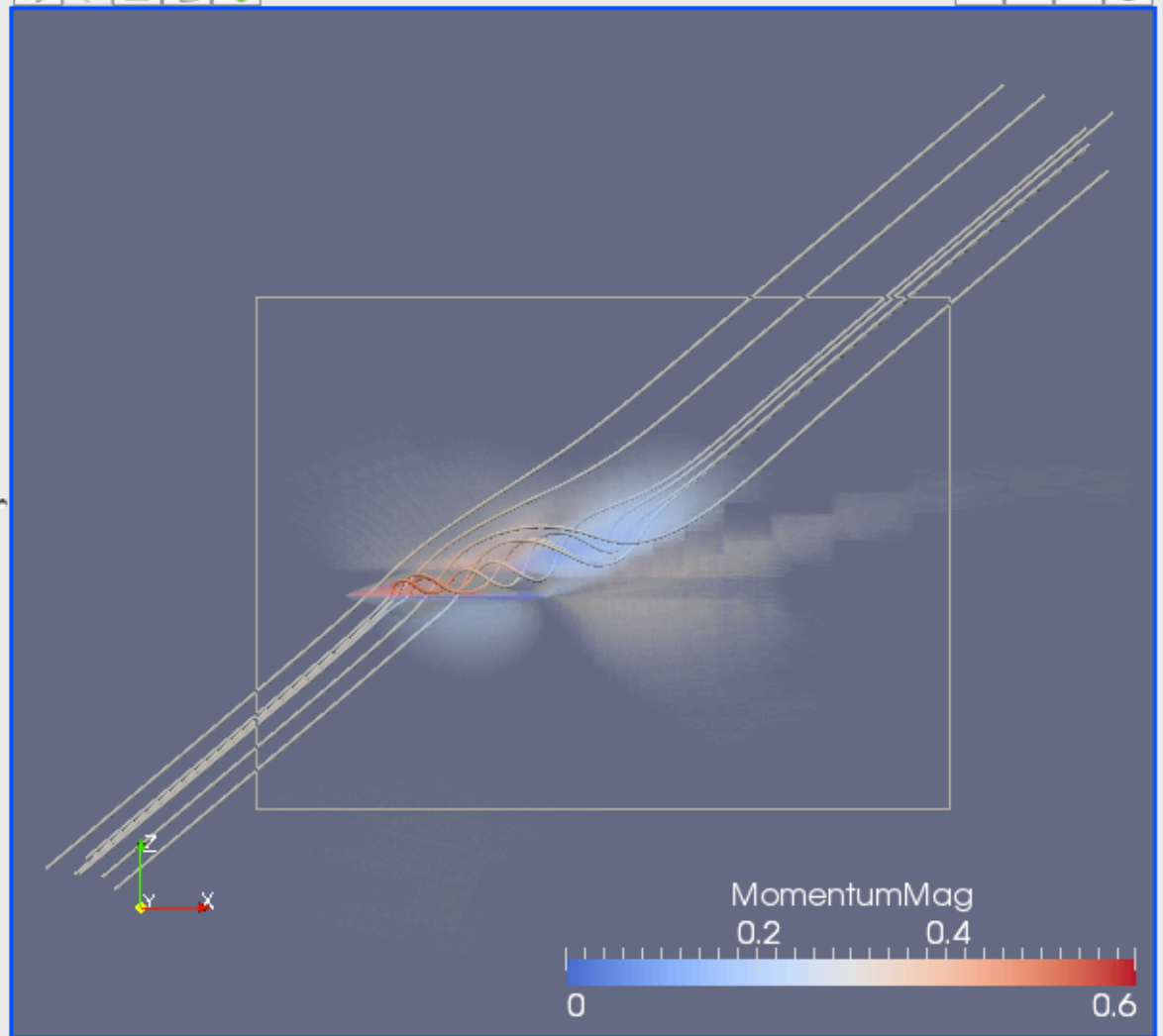
Apply Reset Delete ?

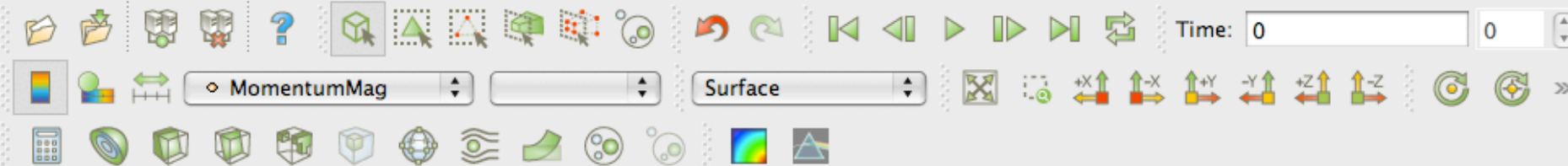
Scalars MomentumMag

Lower Threshold 0

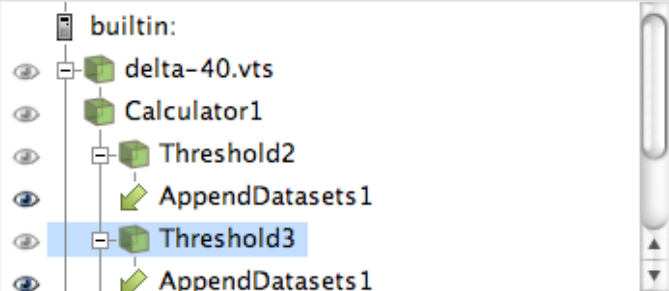
Upper Threshold .299

☒ All Scalars





Pipeline Browser



Object Inspector

Properties Display Information

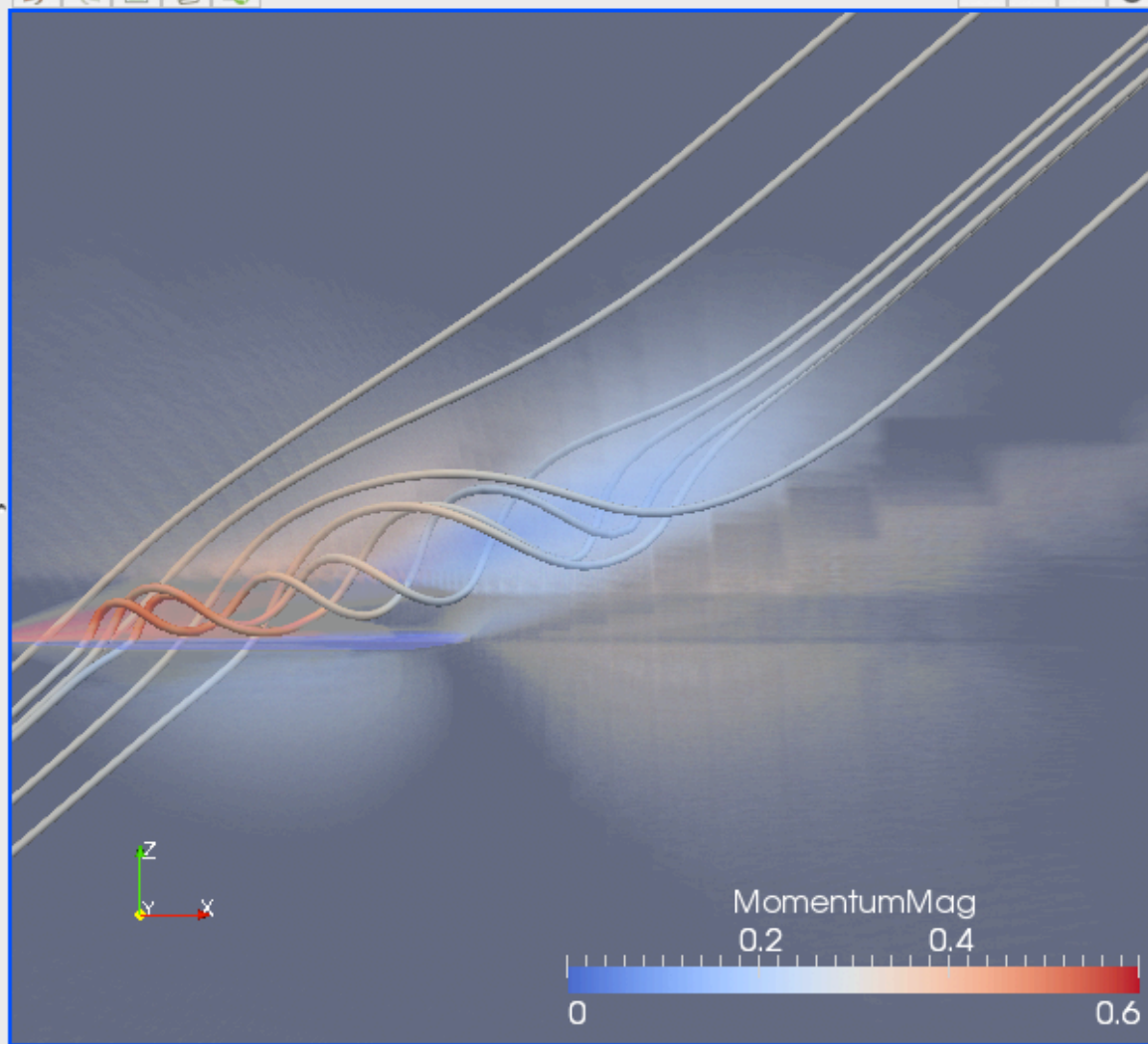


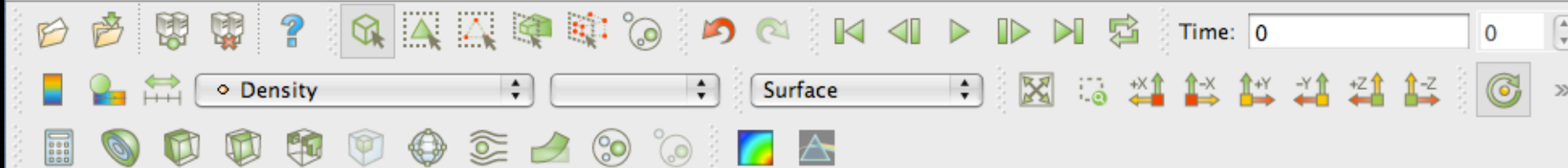
Scalars MomentumMag

Lower Threshold 0

Upper Threshold .299

☒ All Scalars





Pipeline Browser

builtin:
comb.xyz
StreamTracer2

Object Inspector

Properties Display Information

Apply Reset Delete ?

Seeds

Seed Type

Line Source

☒ Show Line

Point1 8.2550001 -6.794569 29.763084

Point2 8.2550001 6.7945690 29.763084

X Axis

Y Axis

Z Axis

Resolution

100

Note: Move mouse and use 'P' key to

(tube)

Generate Tubes

Generate Tubes

Type to search. Enter to select.
Esc to cancel.





Experimental Features

- **VisIt Database Bridge**
- **StreamingParaView**