ORCAN Visualization

Visualization Components
in the Open Reflective Component Architecture

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Overview

- Two interacting components
  - OutputContext
    - Manages interaction
    - Provides a drawing canvas
  - Visualization
    - Bound to an OutputContext
    - Draws something
    - Provides selection feedback

Standard Visualization Realizations

- Visualization Toolkit (VTK)
  based:
  VtkWxOutputContext and
  VtkMeshVisualization
  (default)

- OpenGL based:
 OpenGLWxOutputContext and
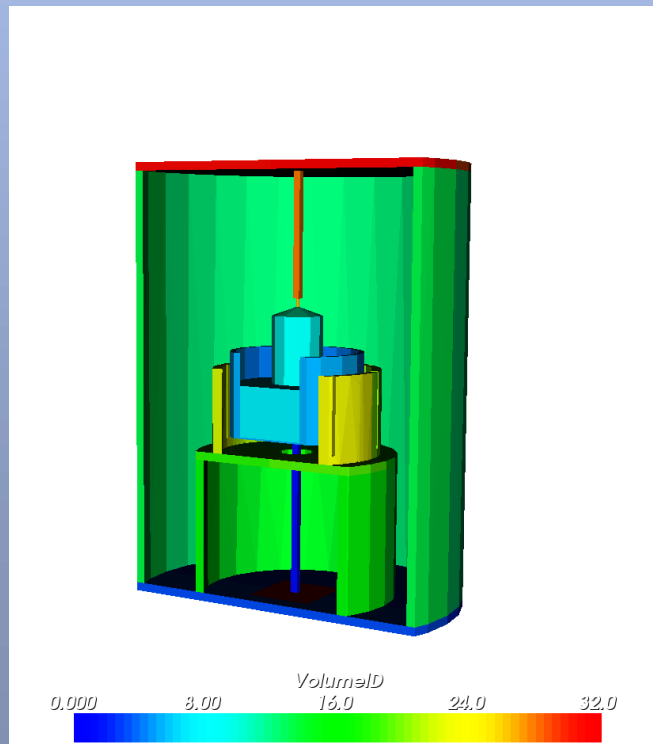 OpenGLMeshVisualization
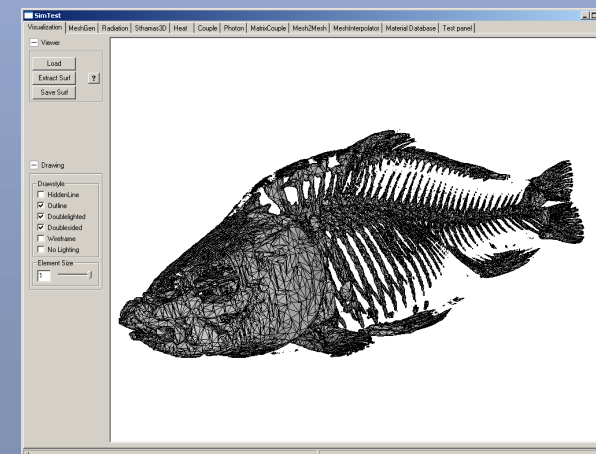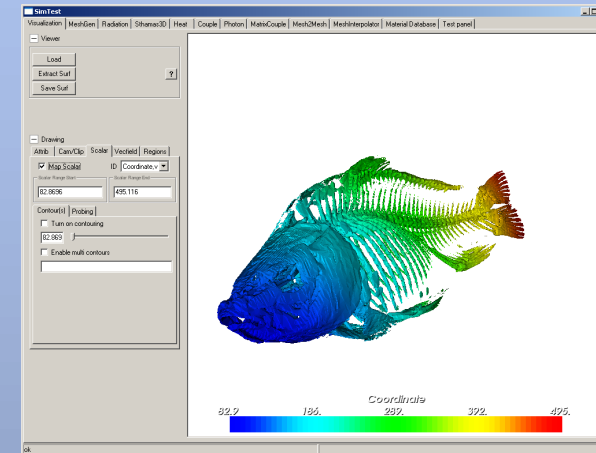
Application Integration

1. Get OutputContext
2. Use OutputContext's `CreateCanvas` to create a drawing area
3. Get Visualization realization from OutputContext
4. Set input data of Visualization

display meshes and data stored at elements, vertices or faces à See SimTest
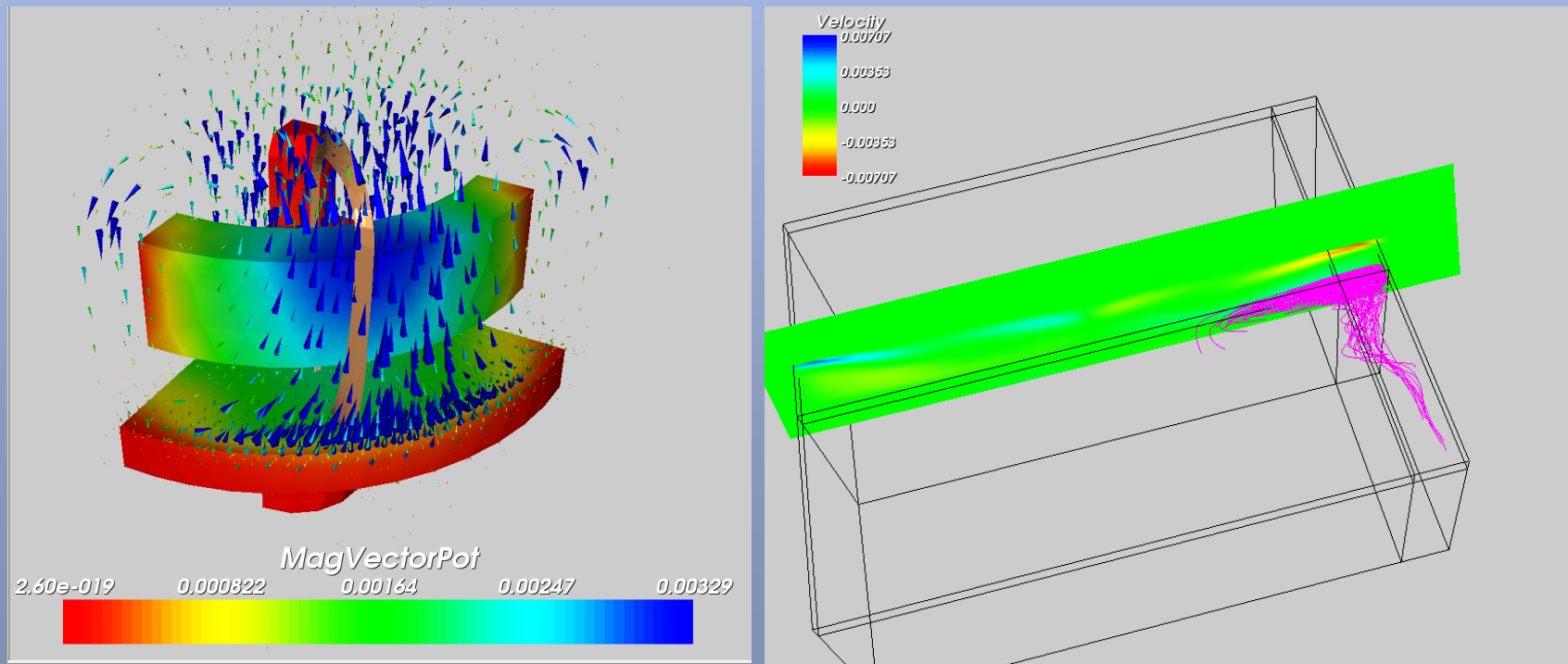
VtkMeshVisualization - Features
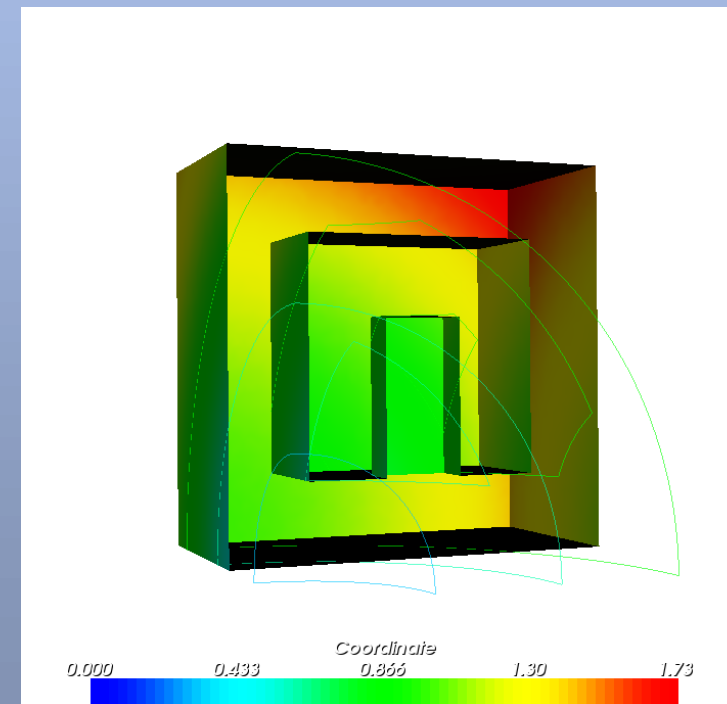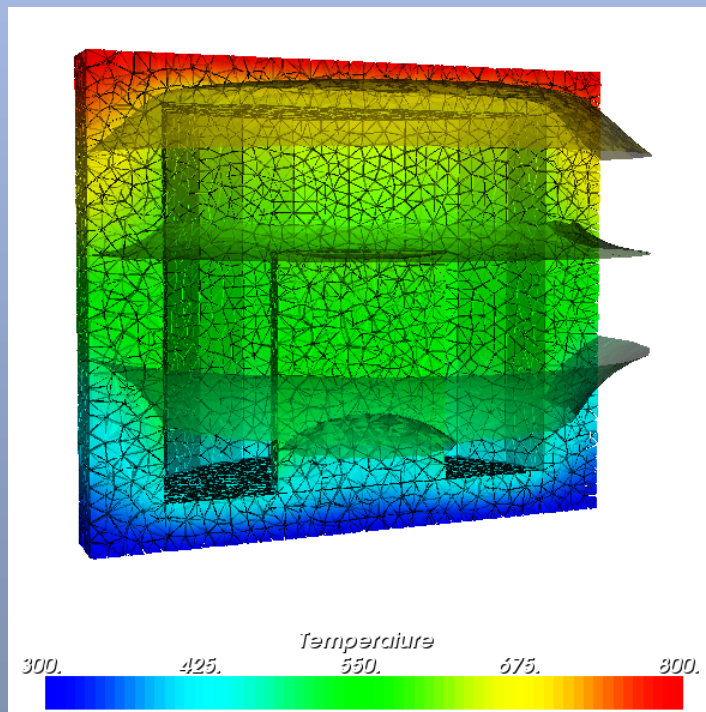
- display volumes and partitions
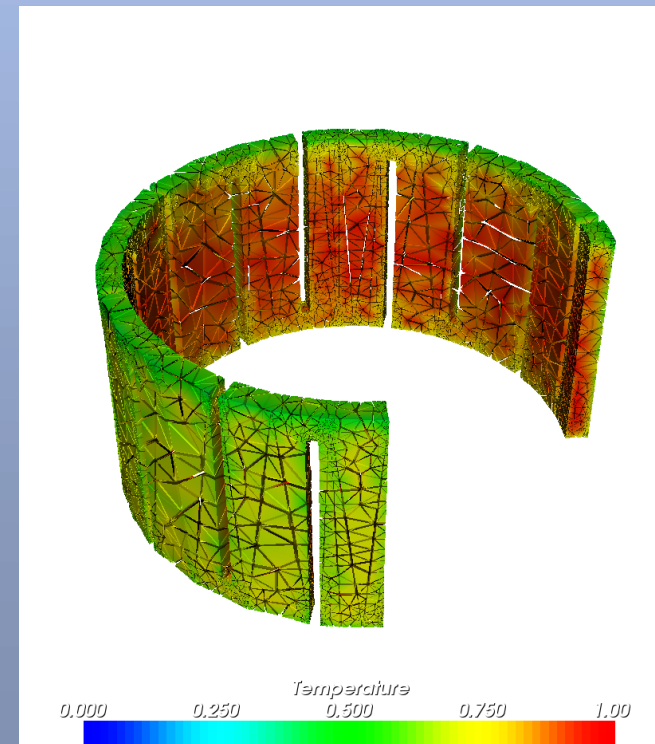
VtkMeshVisualization - Features

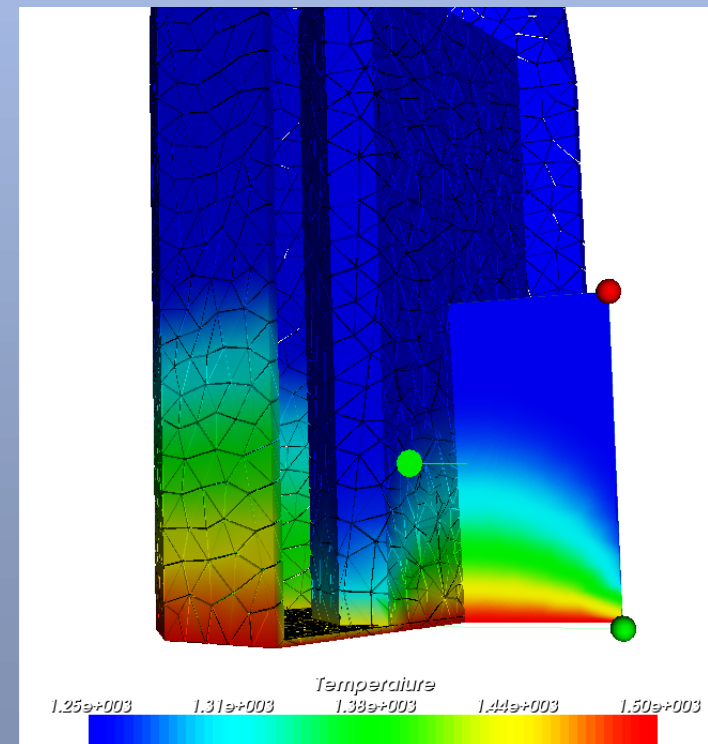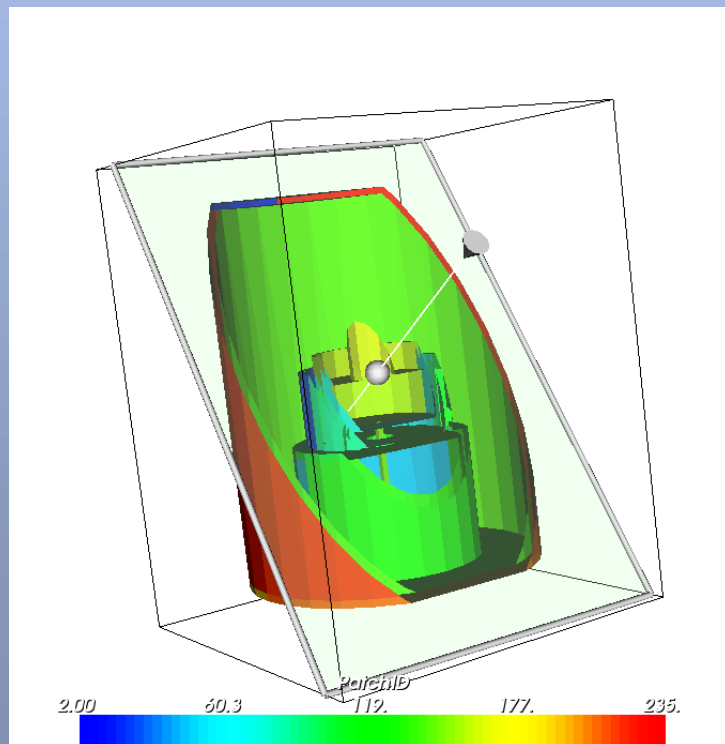- vector fields: glyphs, streamlines + interactive seeds

VtkMeshVisualization - Features

- scalar fields: colorcoding, isosurfaces, isolines

VtkMeshVisualization - Features

- interactive clipping planes / probing planes
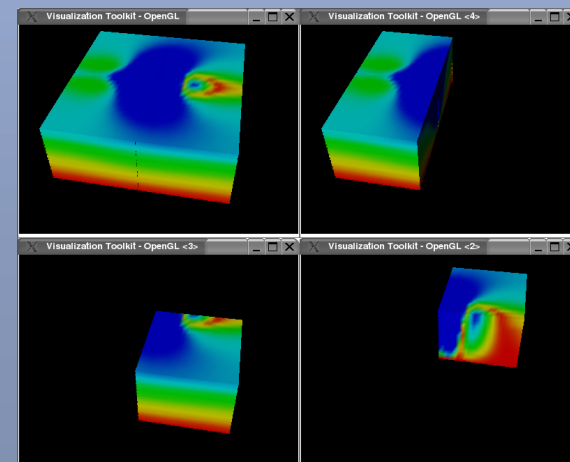
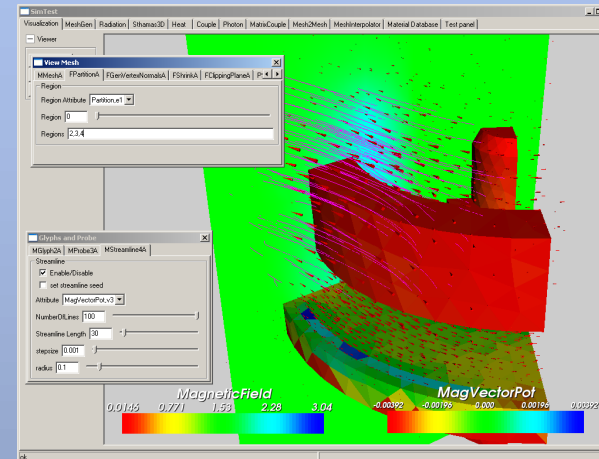# VtkMeshVisualization - Keys

- „j" joystick mode
- „t" trackball mode
- „c" camera mode
- „a" actor mode
- LMB rotate camera / actor
- MMB pan camera / translate actor
- RMB zoom camera / scale actor
- „3" render stereo

- „e" exit
- „f" fly to cursor
- „p" picking mode
- „r" reset camera
- „s" view surfaces
- „w" view wireframe
- „u" invoke user defined method
- „i" enable / disable interactor

Visualization Interfaces

- ocs::IVisualization**Default**
  - basically a 'Draw' function
- ocs::IVisualization**Interactive**
  - used by context to report interaction events
- ocs::IVisualization**MeshVisSingle**
  - set SurfMeshRef/VolMeshRef to be drawn
- ocs::IVisualization**GeometryVis**
  - set GeometryRef to be drawn
- ocs::IVisualization**MeshPicker**
  - Selection feedback

Visualization – Work in Progress

- **VtkMultiVisMeshVisualization**
  - Configurable scene-graph (XML)
    - New interfaces:
      - ocs::ISceneFile,
        ocs::ISceneInfo,
        ocs::ISceneQuery,
        ocs::ISceneCopy,
        ocs::ISceneChange
  - Easy extension
  - OpenGL2.0 Shaders
  - Only works with VtkUGridVolMesh

- **VtkParallelMeshVisualization**
  - data parallel visualization

Visualization Demo