

Crustal Deformation Modeling Tutorial

Meshing Strategies

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Meshing Complex Geometry

Steps in creating a mesh

- Determine geometric features needed
 - Fault geometry
 - Topography
 - Sharp structural boundaries
 - Magma sources with complex geometry
- Create spline curve (2D) or NURBS surface (3D) in CUBIT
- If using surface in several models export it for future use
- Use surfaces within CUBIT to webcut volumes
- Choose discretization according to type of problem

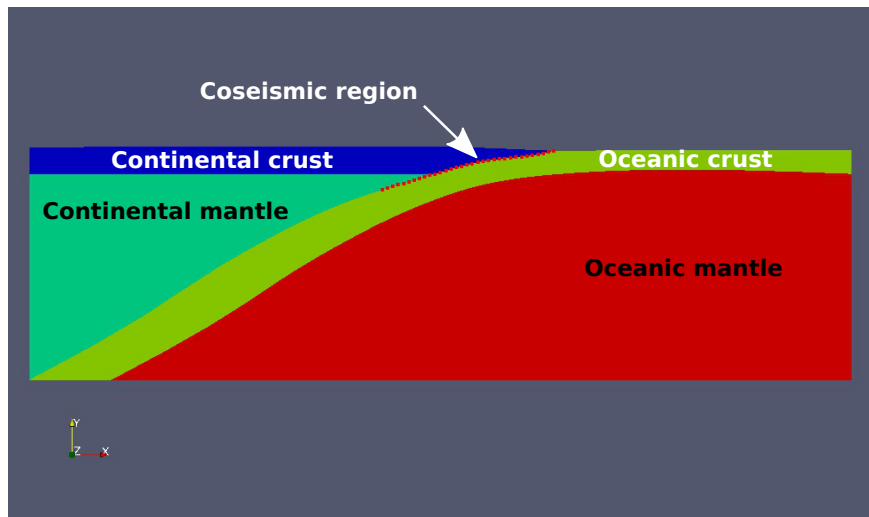
Example problems

2D and 3D meshing of nonplanar geometry and variable discretization

- Two-dimensional subduction zone example using curves
[src/pylith/examples/2d/subduction](#)
 - Top of slab
 - Bottom of slab
 - Topography/bathymetry
- Three-dimensional subduction zone example using NURBS surfaces
[src/pylith/examples/meshing/surface_nurbs/subduction](#)
 - Subduction interface geometry
 - Splay fault geometry
 - Topography/bathymetry
- How to use CUBIT's sizing function to vary discretization size
[src/pylith/examples/meshing/cubit_cellsize](#)

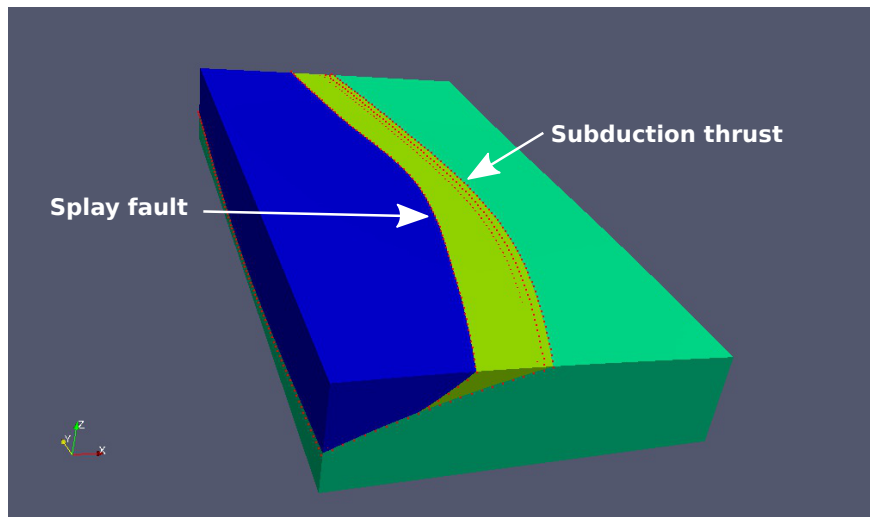
2D Subduction Zone

Mesh with subduction thrust, slab bottom, and topo/bathymetry



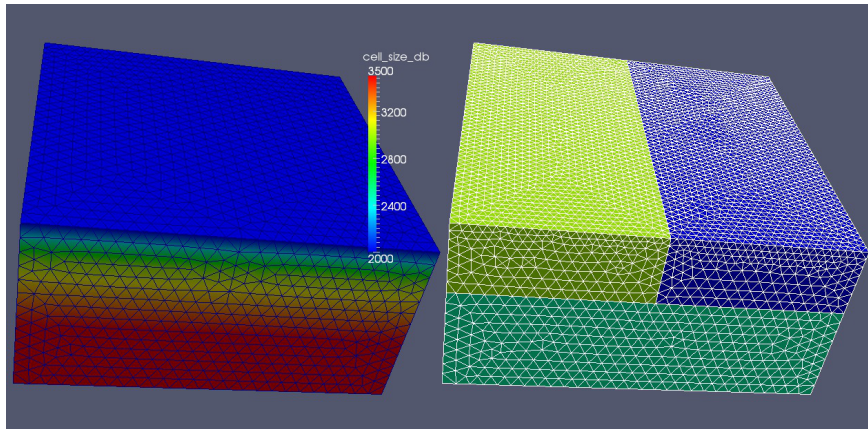
3D Subduction Zone

Mesh with subduction thrust, splay fault, and topo/bathymetry



Using user-defined fields to control mesh size

Example 1: Use a spatial database to control cell size



Using user-defined fields to control mesh size

Example 2: Use an analytical function to control cell size

