

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/Trelis
- If using surface in several models export it for future use
- Use surfaces within CUBIT/Trelis to webcut volumes
- Choose discretization according to type of problem

Example problems

3-D meshing of nonplanar geometry and variable discretization

- Three-dimensional subduction zone example using NURBS surfaces

[examples/meshing/surface_nurbs/subduction](#)

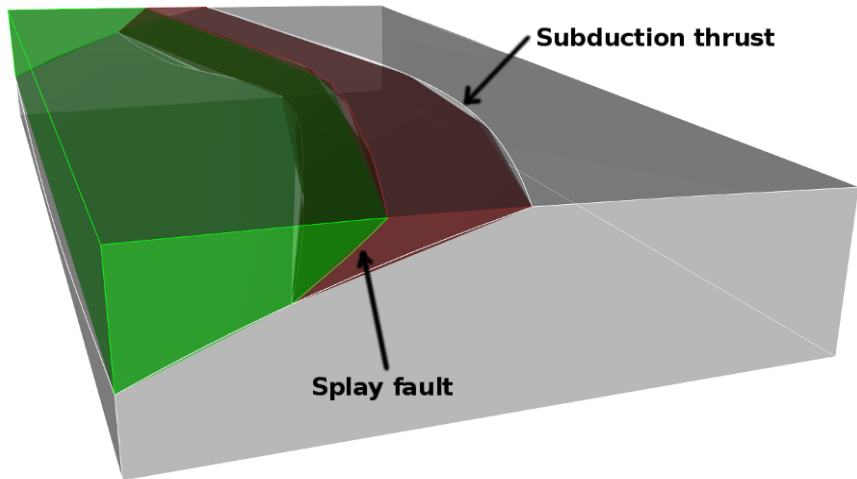
- Subduction interface geometry
 - Splay fault geometry
 - Topography/bathymetry
- How to use CUBIT's sizing function to vary discretization size

[examples/meshing/cubit_cellsize](#)

These examples have been verified to work with CUBIT 14.x and Trelis 15.0.

3-D Subduction Zone

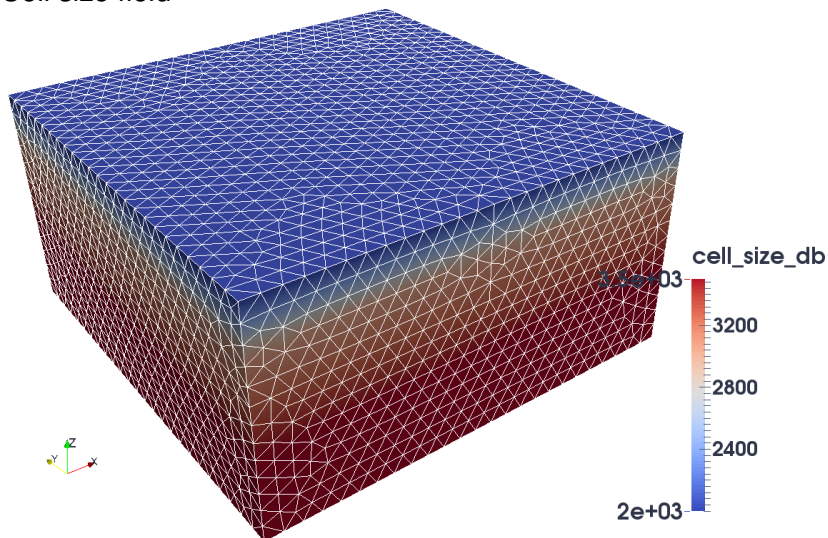
Mesh with subduction thrust, splay fault, and topo/bathymetry



Using user-defined fields to control mesh size

Example 1: Use a spatial database to control cell size

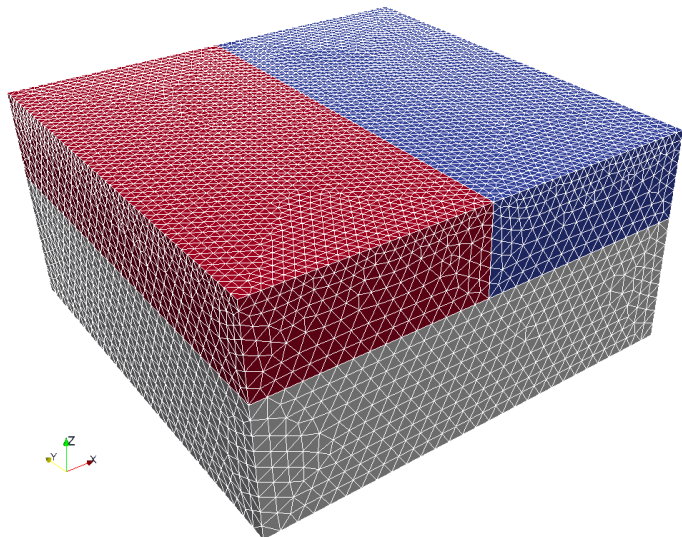
Cell size field



Using user-defined fields to control mesh size

Example 1: Use a spatial database to control cell size

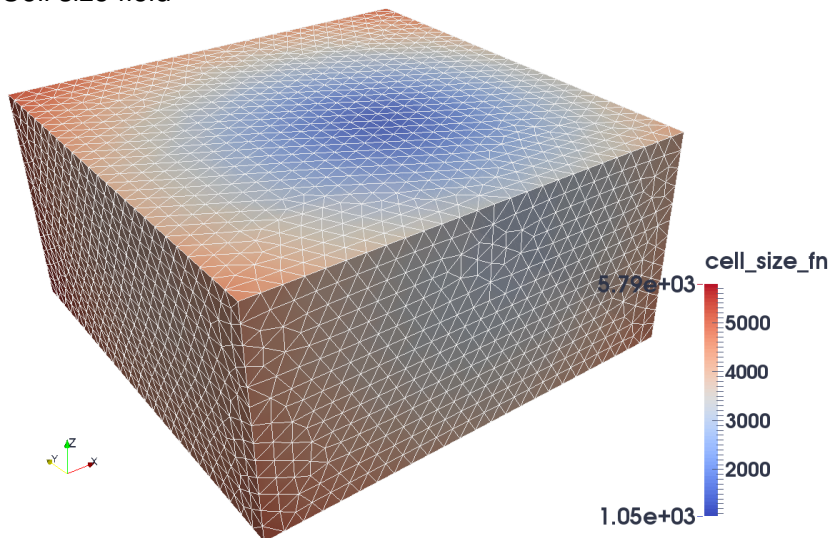
Resulting mesh



Using user-defined fields to control mesh size

Example 2: Use an analytical function to control cell size

Cell size field



Using user-defined fields to control mesh size

Example 2: Use an analytical function to control cell size

Resulting mesh

