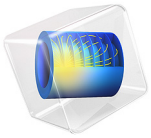

Model created in COMSOL Multiphysics 6.4

Removing Small Geometric Entities with Remove Details

Introduction

This tutorial demonstrates the use of the Remove Details operation for automatic defeaturing of an imported CAD geometry of a wheel rim. Remove Details leverages virtual geometry operations to automatically detect and delete small features on the finalized geometry.

The geometry is automatically analyzed for details as you leave the geometry branch of the model tree to set up physics or create a mesh. When small details are detected you have the choice to automatically remove the details or to step through the Cleanup Wizard. One of the tools that the geometry cleanup uses is the Remove Details operation.

The repair and defeaturing tools that find and delete small geometry features can operate only within the limits of what is allowed by the topology of the geometry. To handle more complex cases, where defeaturing fails, you can use virtual geometry operations. With these tools you can set geometric entities, such as vertices, edges, or faces, to be ignored by the mesher. Since selected elements are "hidden" from the mesher, meshing takes place on a virtual geometry, hence the name virtual operations.

Virtual operations work on the finalized geometry, that is, the geometry after the Form Union or Form Assembly nodes. This means that using these operations you may remove small domains that result from intersecting solid objects. Another benefit is that they keep the curvature of the geometry, which may be important when removing larger faces, or for certain physics applications when altering the curvature of the geometry can for example give rise to stress concentrations.

For the step-by-step instructions of this tutorial, see the book *Introduction to Design Module*.

Application Library path: `Design_Module/Tutorial_Examples/wheel_rim_remove_details`
