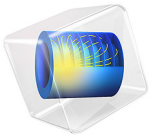
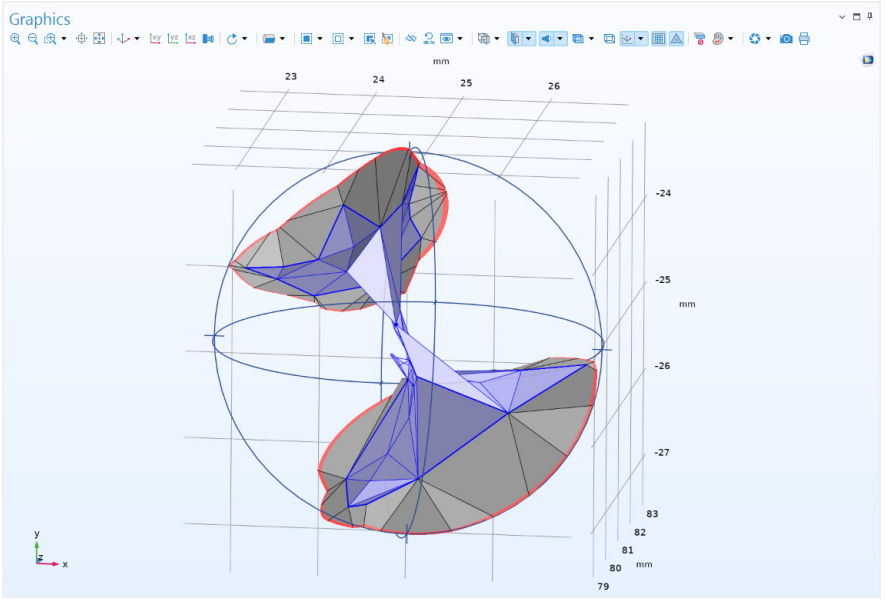


Add-in created in COMSOL Multiphysics 6.4

Mesh Partition with Ball

Introduction

As you edit and repair imported meshes, you may notice that you repeatedly use certain operations, like partitioning. This is particularly common when working with surface meshes that originate from medical scans, as they may contain self-intersecting elements that we want to delete from the mesh. To streamline your modeling workflow, you can use this add-in to create a Partition with Ball feature based on a Clip Sphere in the Graphics window. You may also manually enter the ball's radius or set it to twice the average mesh element size. The center of the ball can also be set to the center of rotation in the Graphics window. The figure below shows the faces created by a Partition with Ball feature added by this add-in. The faces with the intersecting elements can now be easily deleted and replaced.



Add-in Library path: `COMSOL_Multiphysics/mesh_partition_with_ball`

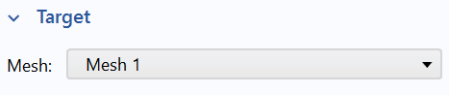
TOOLBAR

Use the toolbar at the top of the **Settings** window for navigating between the different steps.

Click **Create** to create and build a new Partition with Ball operation in the selected meshing sequence. Click **Refresh** to refresh the available options of the ball **Radius** list after activating or deactivating clipping.

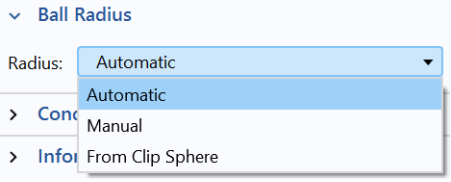
TARGET

In the **Target** section, from **Mesh** list you can specify the meshing sequence for which the Partition with Ball node should be created. You can only select meshes that define their own geometric model, and are not locked or empty. The list contains the applicable meshes from the current component.

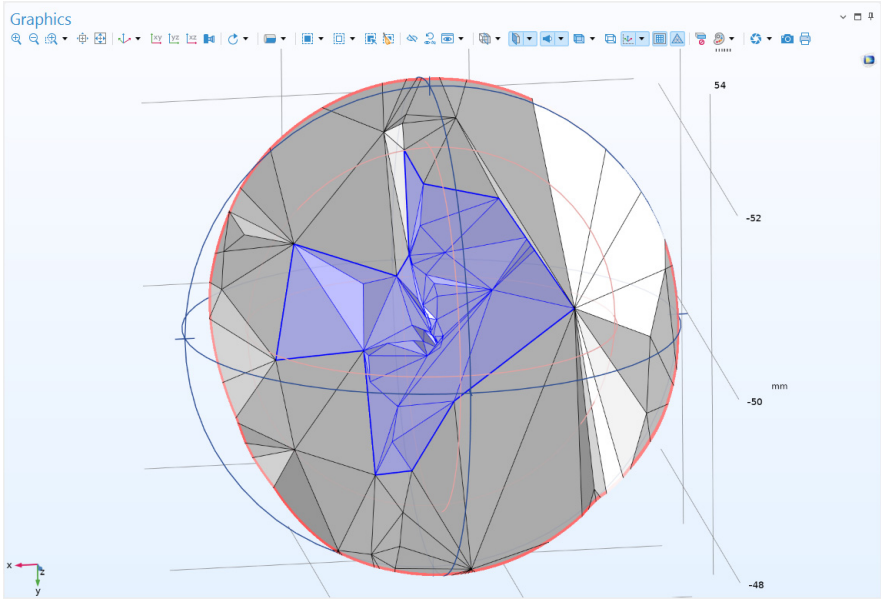


BALL RADIUS

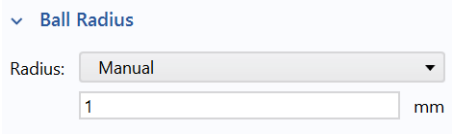
The options for the ball **Radius** include three different methods for specifying the radius of the Partition with Ball operation, as shown in the figure below.



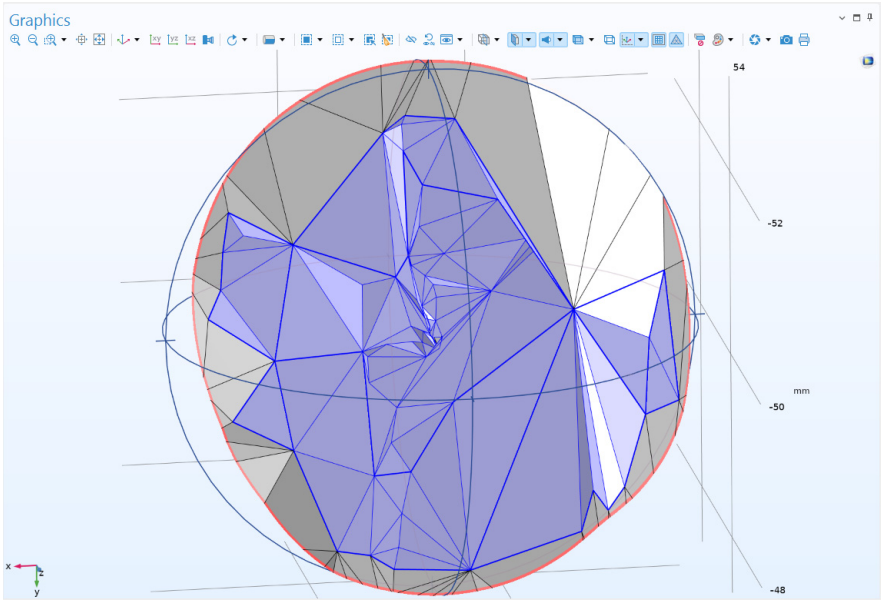
Select **Automatic** to calculate the radius as twice the average mesh size.



The **Manual** option allows you to enter a user-defined value for the radius, as shown in the figure below.



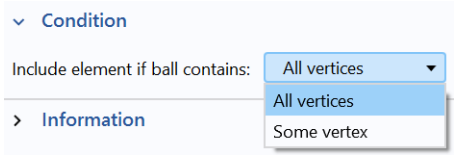
With a **From Clip Sphere** option the radius is set to be the same as the radius of the clip sphere from the graphics window. Adjust the clip sphere to the desired size, before creating the Partition with Ball feature.



For the Partition with Ball feature that is created, the center of the ball is set to the center of the clip sphere if **Radius** is set to **From Clip Sphere**. When **Radius** is **Automatic** or **Manual**, the center of the ball is set to the center of rotation in the Graphics window. To modify the center of rotation, you can middle-click on the canvas, or click the **Center at Coordinates** button in an Error or Information node in the meshing sequence. Note that setting the rotation point in the Graphics windows and using Clip Sphere is only supported for the OpenGL renderer.

CONDITION

From the **Include element if ball contains** list select the condition for which a mesh element is considered enclosed by the specified ball. Choose **All vertices** to enclose only the elements that have all of their vertices inside the ball, or choose **Some vertex** to enclose the elements with at least one vertex inside the ball.



INFORMATION

In the **Information** section, you will find a short description of the add-in functionality.