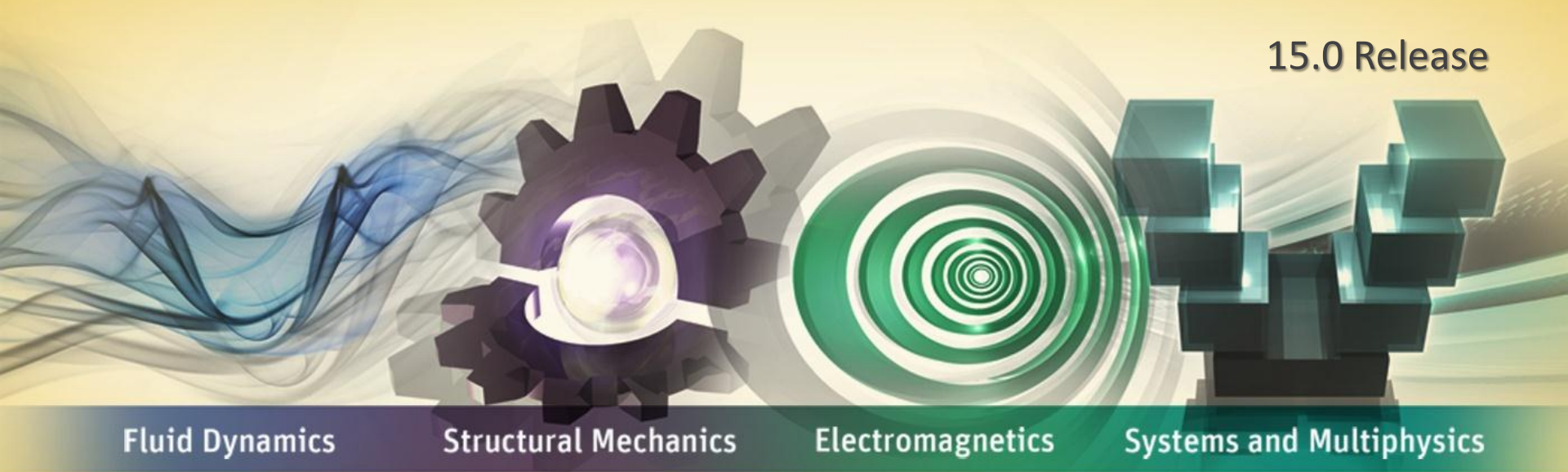


Appendix 5

Additional Prism Meshing Features

15.0 Release

A horizontal banner with a yellow background. It features four distinct 3D visualizations: blue fluid flow lines on the left, a purple gear with a glowing center, a green concentric circle pattern, and a stack of blue and black cubes on the right. Below these images is a dark blue bar with white text labels for each category.

Fluid Dynamics

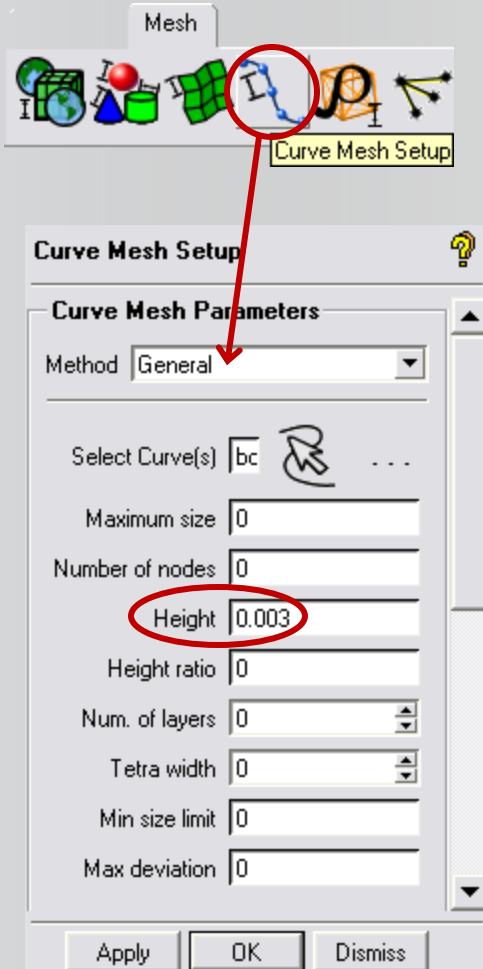
Structural Mechanics

Electromagnetics

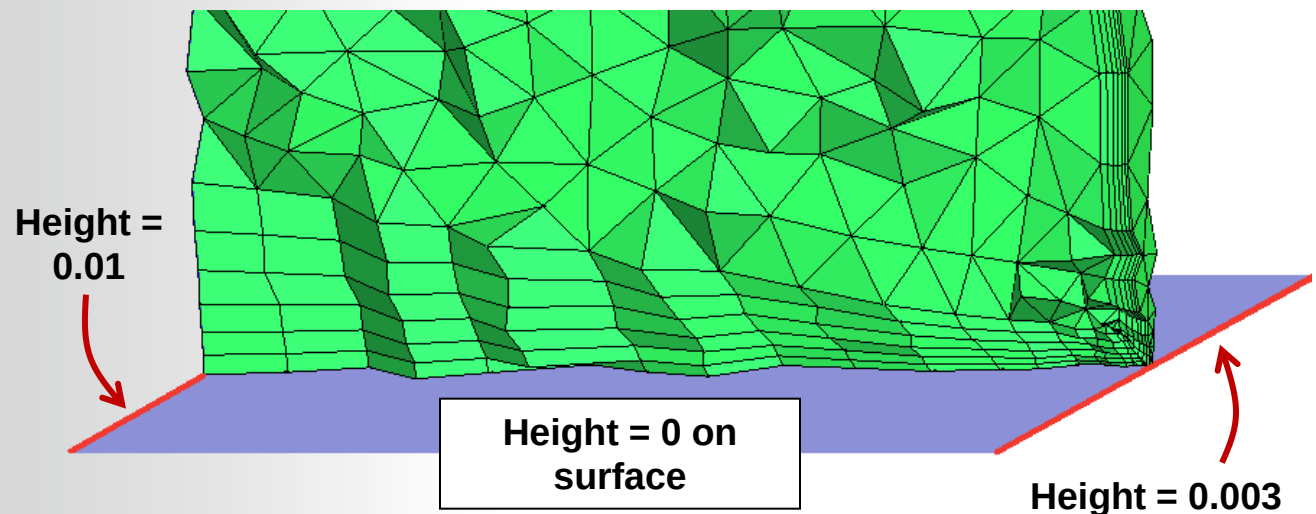
Systems and Multiphysics

Introduction to ANSYS ICEM CFD

Setting Prism Parameters on Curves

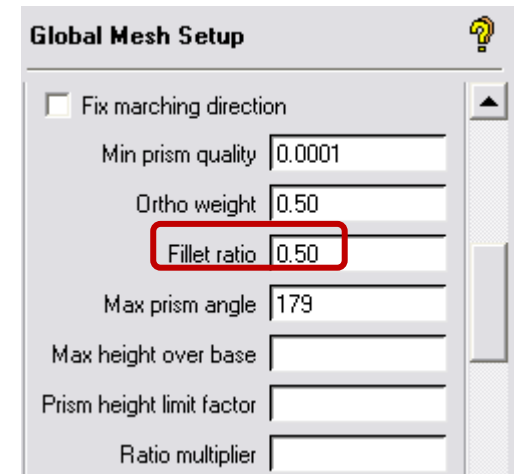


- **Mesh > Curve Mesh Setup**
 - You can get Prism to transition linearly across a surface by not setting a height (height = 0) on the surface, but instead set a different height on each curve on the opposite sides of the prism surface
 - **Height ratio** and **Num. of layers** have no affect on prism for curve settings
 - Global **height** must also be zero
 - **Interpolate heights** must be ON in **Advanced Prism Parameters**

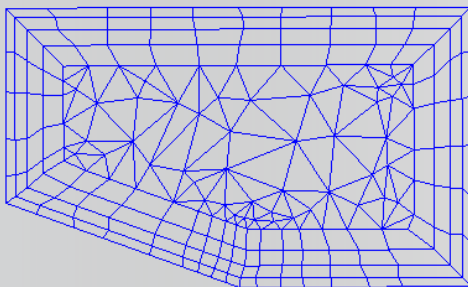


Prism Options – Fillet Ratio

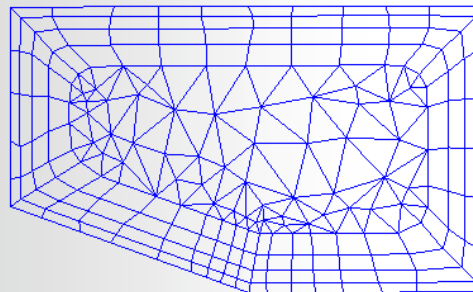
- Blends prism grid lines around sharp corners
 - 0 = no fillet
 - 1 = fillet radius equals last prism height
- Improves angles further away from the corner
- Orients prisms more in direction of flow
- If meshing tight spaces with tight curves (less than 60°), may not have space for a fillet radius



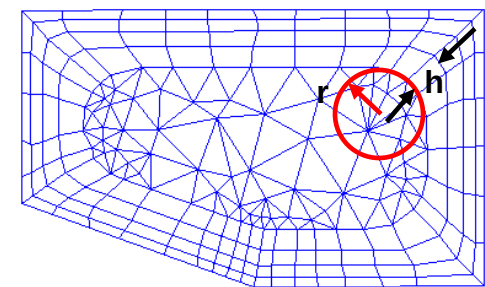
$$\text{Fillet Ratio} = r/h$$



Fillet Ratio = 0.0



Fillet Ratio = 0.5



Fillet Ratio = 1.0

Prism Options-Part Control

New volume part

- Can specify new Part for prism elements
 - Must specify if extruding from surface-only mesh
 - If extruding into volume mesh, prism will inherit tetra volume part if this field is left blank

Side part

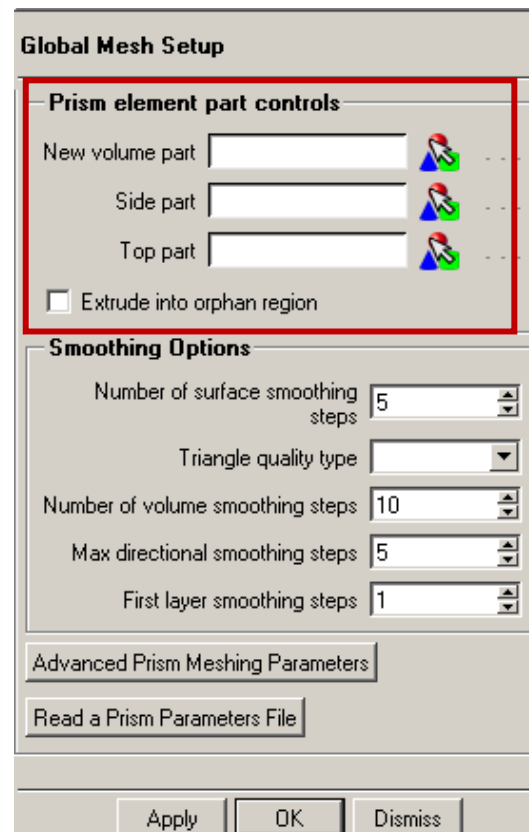
- For quad faces on prism side boundary

Top part

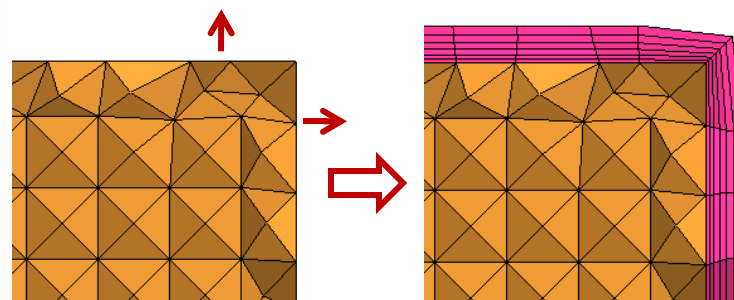
- For tri faces capping off top of last prism layer

Extrude into orphan region

- Extrude prisms away from existing volume, not into it
- Must specify *new volume, side and top* part, or they'll be in ORFN

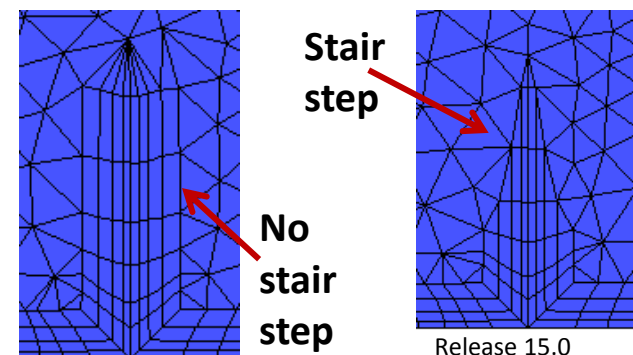
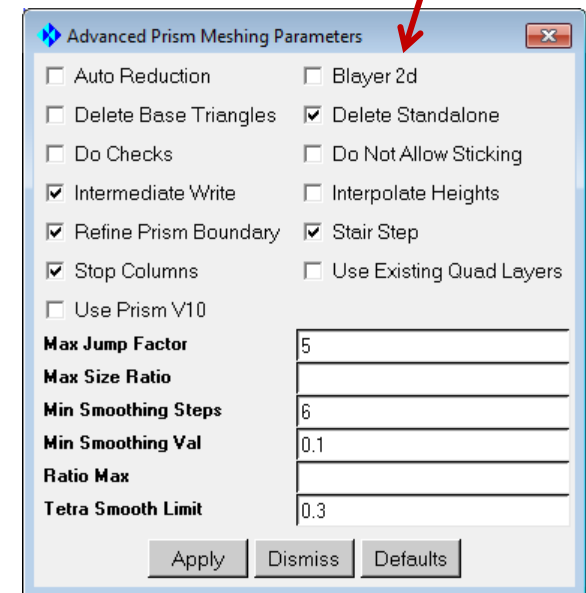
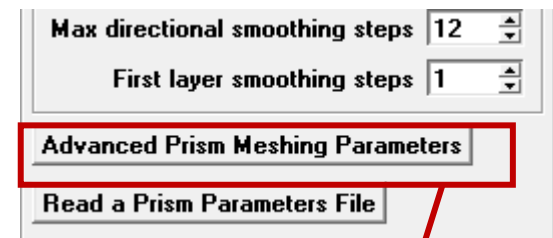


Leaving these parts blank will inherit the names from the current mesh



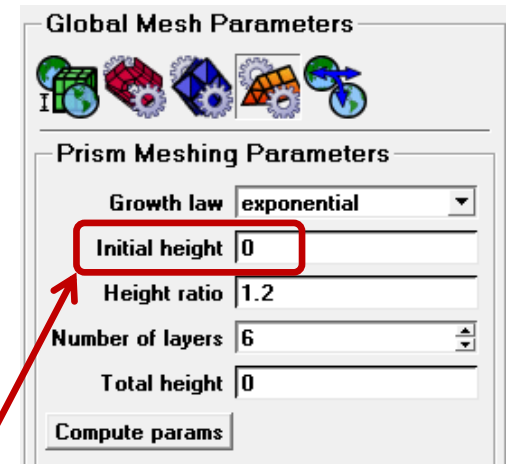
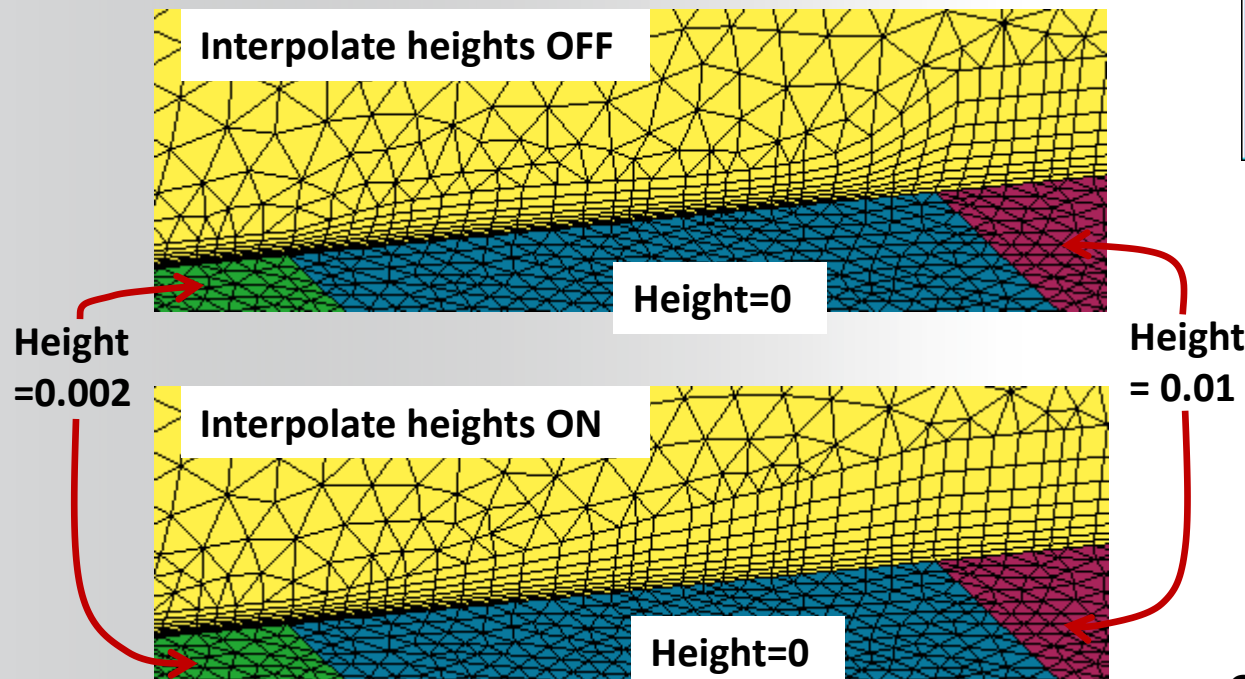
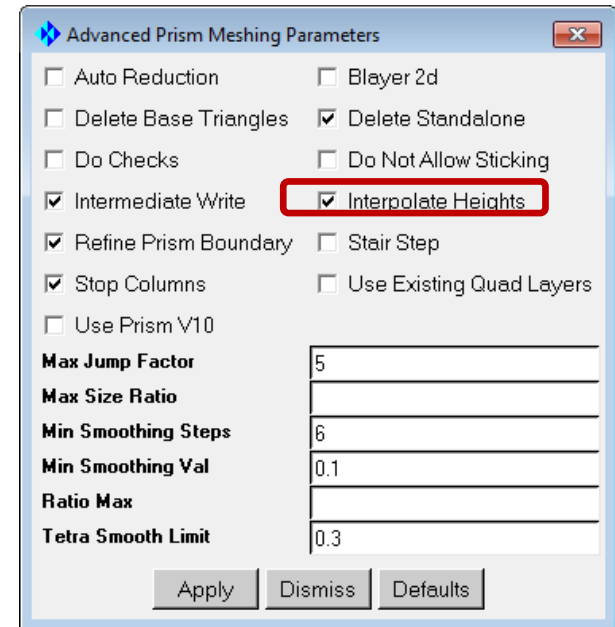
Advanced Prism Meshing Parameters

- These are best left at default for most models
- **Auto Reduction**
 - Achieves layer compression
 - Produces very thin layers where otherwise collisions would result in pyramids
 - Must redistribute prism layer afterward
- **Intermediate write**
 - Writes “*prism.uns*” after each layer in case the process crashes
 - Open *prism.uns* and inspect for problems
- **Blayer 2d**
 - For running prism on a 2D model
 - Select curve parts instead of surface parts for inflation
 - Must select surface parts in place of volume parts
- **Stair Step**
 - Controls gradual or immediate reduction where the number of layers must be reduced



Advanced Parameters - Interpolate Heights

- Affected by any **Parts** with height set to zero when the global height is also zero.
 - The default is OFF, which causes these parts to float the height to get a smooth transition at the last prism layer, as shown in previous slide 11
 - With **Interpolate Heights** ON, the height will transition across the part to match the heights set on parts at its ends



Global height must also be zero