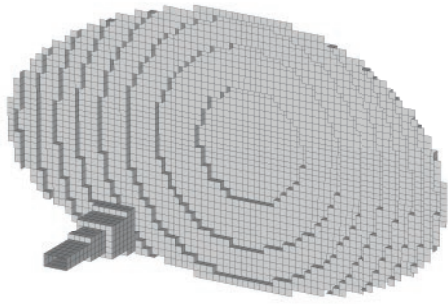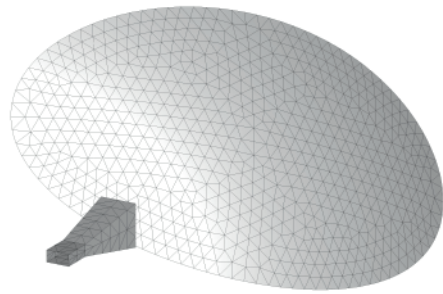# Robust, Accurate Meshing

Meshing techniques: Various meshing strategies for a simple reflector antenna: staircase, curved tetrahedral, curved hybrid surface, and the proprietary CST technology PBA.


In simulation, structures and fields are discretized onto a mesh. Each additional cell increases the computational requirements of the simulation, which means that it is advantageous if the mesh accurately describes the model while using as few mesh cells as possible. CST STUDIO SUITE includes **hexahedral** and **tetrahedral** volume meshes and **hybrid triangular and quadrilateral** surface meshes, with different approaches suitable for different situations.
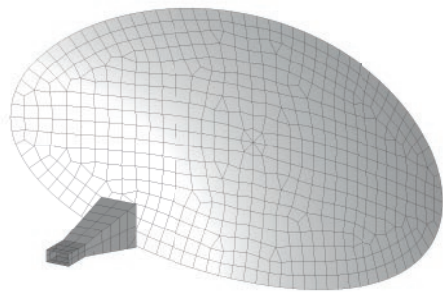
To improve the accuracy of the hexahedral mesh without affecting performance, CST STUDIO SUITE uses the **PERFECT BOUNDARY APPROXIMATION (PBA)®** mesher in its transient solver. PBA retains the speed advantages associated with a conventional staircase mesh, but allows curved structures to be modeled accurately without requiring an extremely dense mesh.
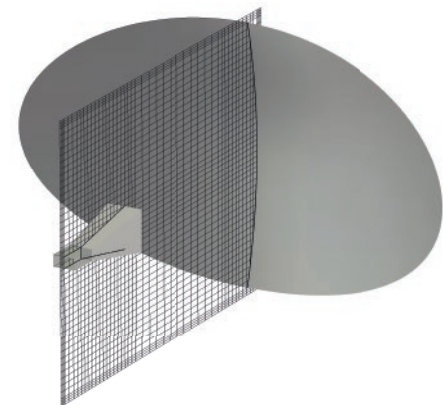
The tetrahedral mesh and the surface meshes can take advantage of **curved elements** in both high and low frequency simulations. In addition, the mesh refinement algorithms of the frequency domain solvers can take advantage of **CST True Geometry Adaptation**. This projects the refined mesh back onto the original model, smoothing out the coarse, faceted mesh and allowing greater accuracy in the simulation.
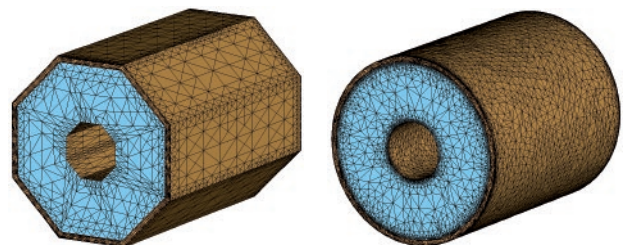
Mesh refinement: Coaxial waveguide after traditional mesh adaption approach (left) and CST True Geometry Adaptation (right).