# Revisions for VISRAD 18.2.0

- The ability to display lines of sight from *Diagnostic Ports* in the *Main Graphics Frame* has been added. It is also possible to rotate about a line of sight.
  - The lines of sight (LOS) for individual *Diagnostic Ports* are set to be viewable in the *Port Positions* dialog the (check box is in the right-most column).
  - Use the *Show | Diag. Port Lines of Sight* menu item to set whether LOSs are visible in the *Main Graphics Frame*. When turned on, all ports that are designated to have *LOS Viewable* will have their LOS displayed. Using this menu item, all lines of sight can be shown/hidden.
  - Each LOS extends from target chamber center (TCC) toward the port (shown as a green line). The length of the LOS is set equal to the length of *Axes* that can also be shown (see *Show | Axes* menu item). This length can be adjusted on the *Graphics* tab of *Preferences*.
  - To rotate about the LOS, click on the (⊕) navigation control button on the right side of the *Main Window*. Then select a *Diagnostic Port* using the (▼) button. The selected LOS is shown as a red line.
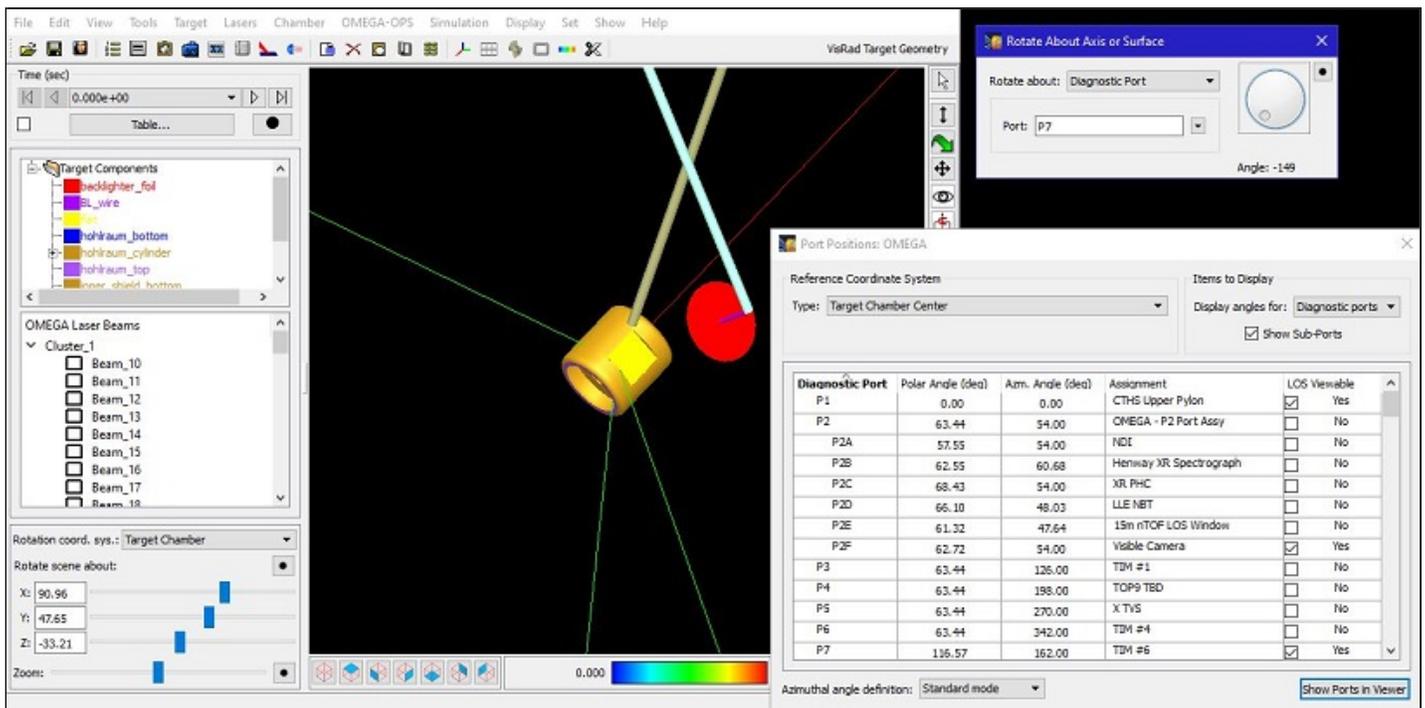
- Importing laser beam data from csv-formatted files: An option has been added to specify that angle data used in setting beam pointing positions are in units of degrees.
- OMEGA Target Chamber:
  - Support has been added for the EP_TOP9 beam. The EP_TOP9 beam is an EP beam that is directed into the P9 port. To add the beam, use the *Lasers | Probe Beams | Add 3ω Beam (EP_TOP9)* menu item.
  - The "4ω" probe beam is now referenced as the "2ω/4ω" probe beam to reflect the fact that a 2ω option is available.
- GEKKO Target Chamber 2 has been added. The laser beam system consists of 12 beams (shown below). A list of diagnostic ports has also been added.
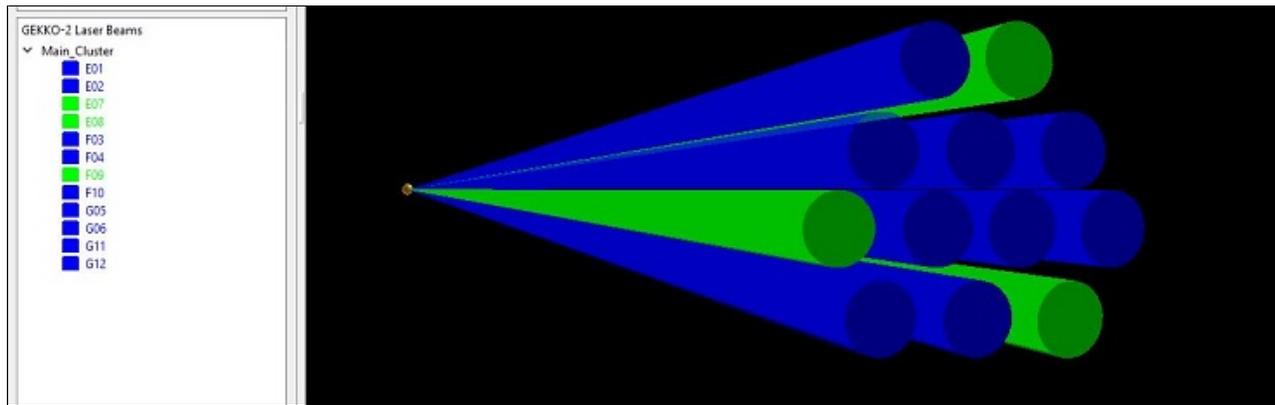
- A CAD file for GEKKO Target Chamber 1 was added to the *VISRAD* distribution (see image below). It can be accessed using the *Chambers | Open Chamber Components Lib* menu item.
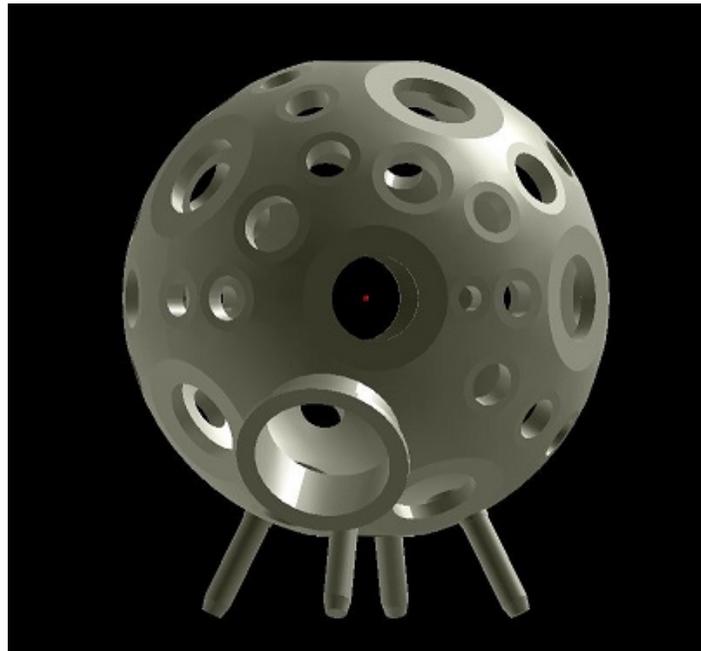
- Bug fixes:
  - *Surface of Revolution* target components: Updates were made to catch divide by zero in analytic formula used to define radius.