

NEW FASANT

ULTRA-CONFORMED REFLECTORS: Training Example 2

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This example presents the design and analysis of a parabolic ultra-conformed reflector using Physical Optics.

Go to *Layout* *Create Main Reflector*. Click *Next*.

Set the frequency to 15GHz and the periodicity to 0.1λ . Choose a parabolic shape and set the focal point of the parabolic surface to 0.3m. Set the focal point of the antenna to 0.2. Click *Next*.

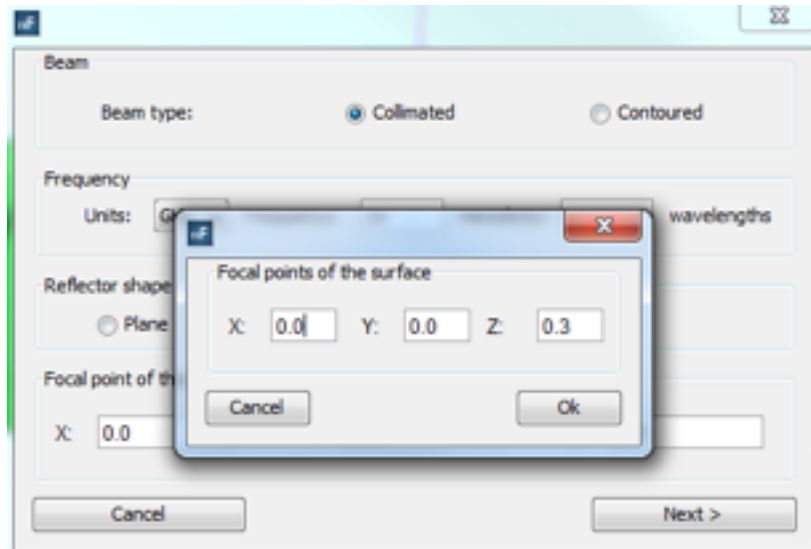


Figure 1 Focal point of the parabolic surface

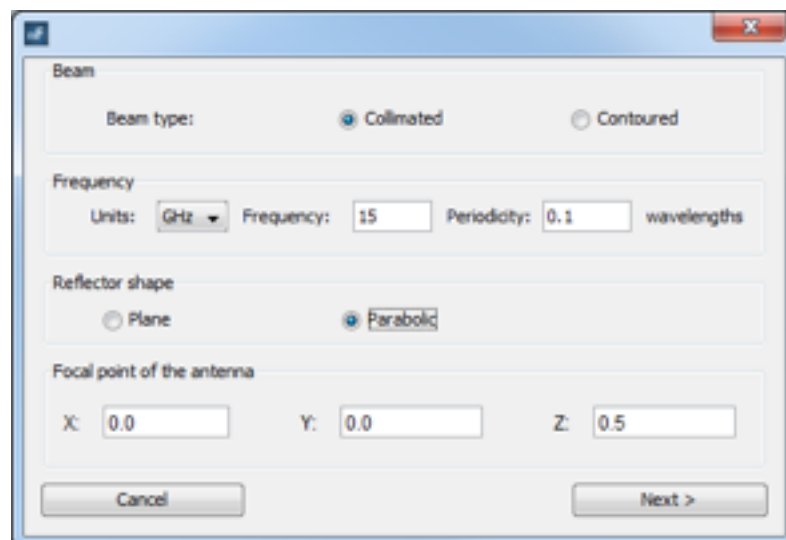


Figure 2 Properties of the main reflector

Set the direction of the main beam to theta = 0 and choose circular arrangement. Set the radius of the main reflector to 0.25m. Click *OK*.

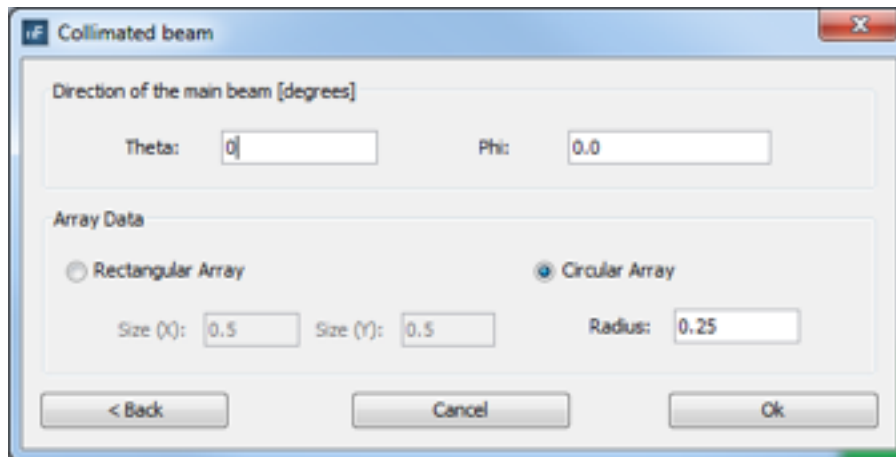


Figure 3 Properties of the collimated beam

When clicking OK, the geometry of the main reflector will be displayed in the main screen.

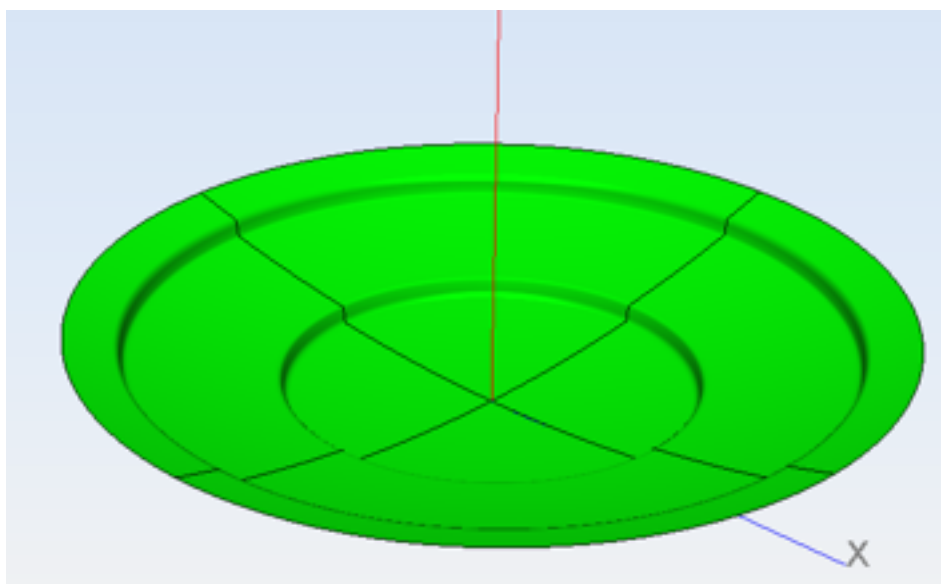


Figure 4 Geometry of the subreflector

Next, set the solver configuration. Go to *Solver Parameters*. The solution method in this example is Physical Optics. Click *OK*.

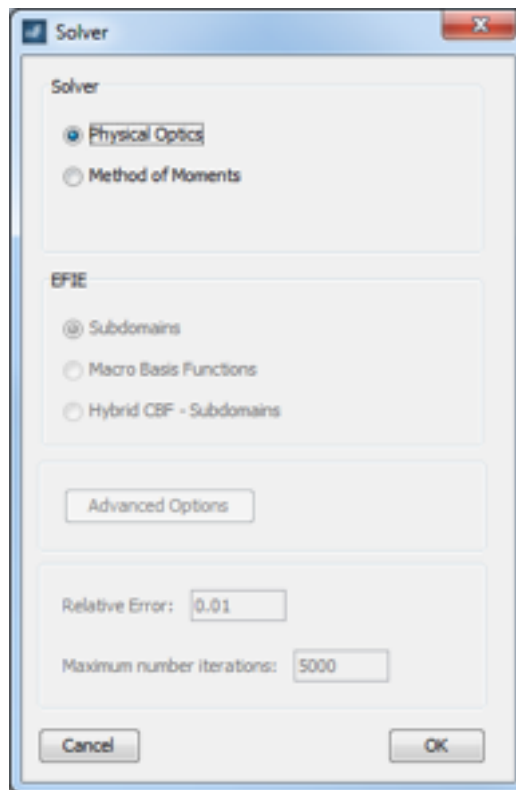


Figure 5 Solver parameters

Now, go to *Antennas Set Feed Antenna Pattern File*. Set one antenna in the next displayed window and click *OK*.

A new window will be displayed to set the antenna properties. First, select the .dia file that has been created in the Training Example 1. Note that the coordinates of the antenna position are automatically set considering the focal length that was indicated when the reflector was generated (0.0, 0.0, 0.5). Finally, the antenna orientation is defined by means of the director cosines. They also are automatically calculated. The antenna always points to the reflector center (0.0, 0.0, 0.0). Click *OK*.

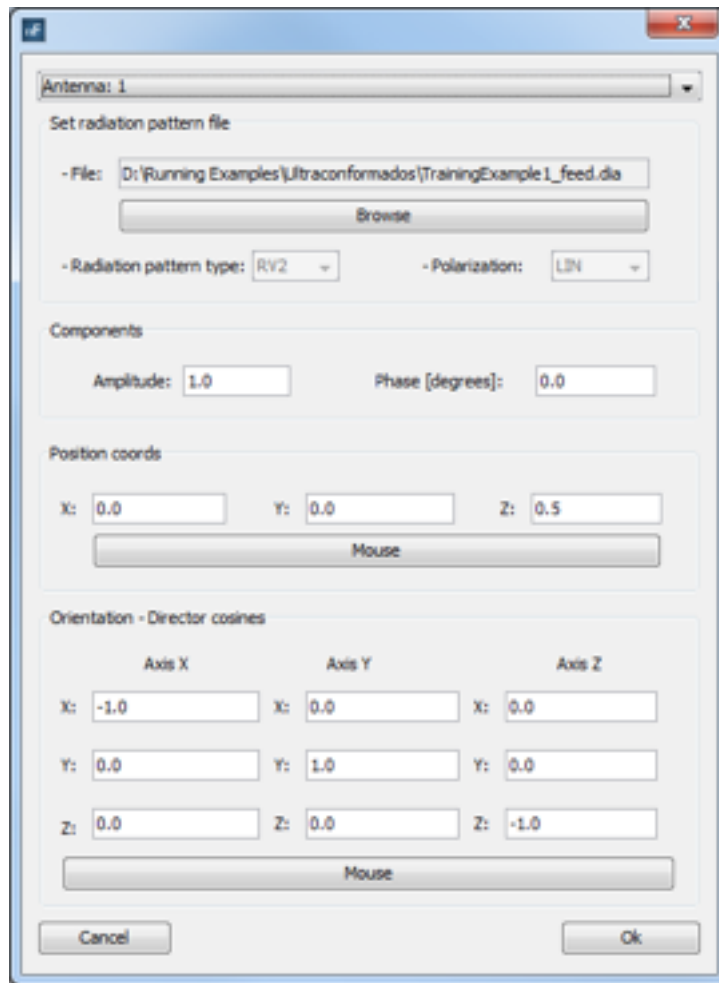


Figure 6 Properties of the radiation pattern file

Note that the antenna is displayed in the main screen in red color. Its reference axes are depicted in green color.

Select *Meshing* *Create and Visualize Mesh* to mesh the geometry. Set the operating frequency and the number of processors and click *OK*.

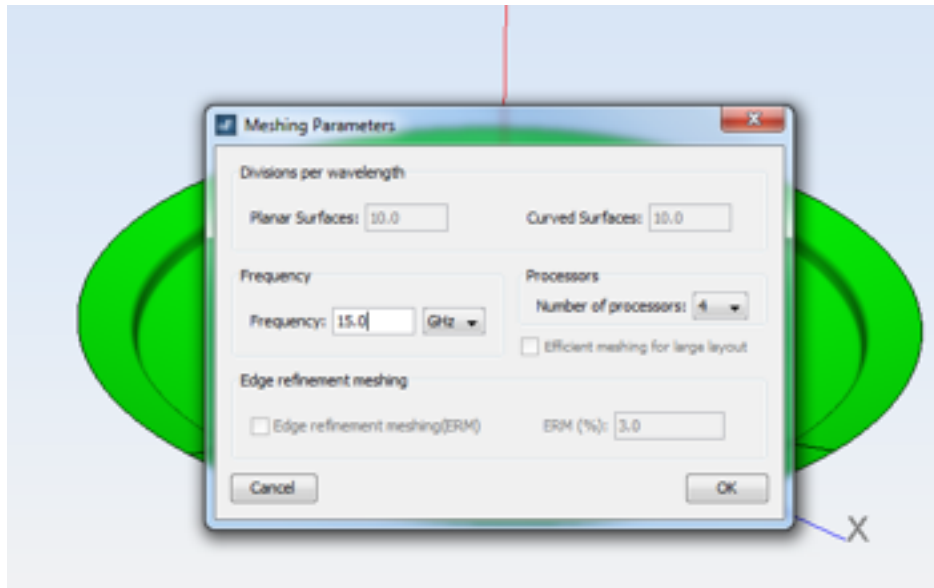



Figure 7 Meshing properties

Once the meshing has finished, it will be displayed in the main screen.

Go to *Calculate*  *Execute* and select the number of processors.

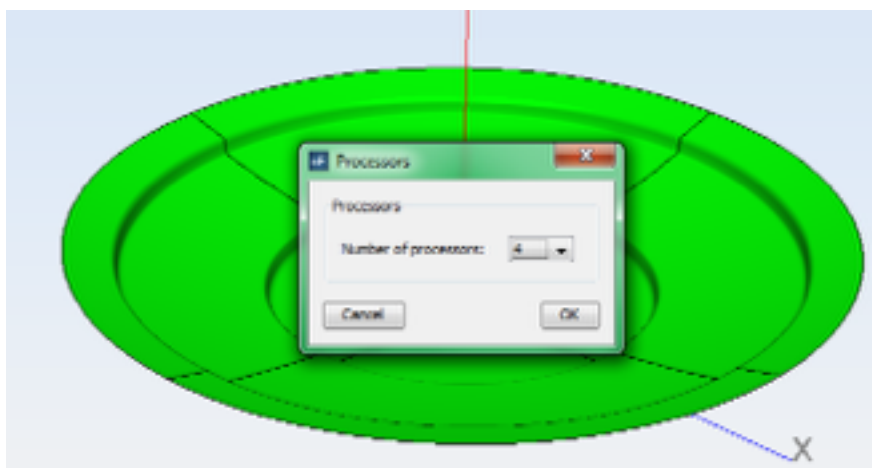



Figure 8 Set the number of processors

Click *OK* to run the simulation.

When the simulation finishes, go to *Show Results*  *View Cuts* to visualize the results. Select the polar option and click *OK*. The cut $\phi = 0^\circ$ of the normalized radiation pattern will be displayed in a new window.

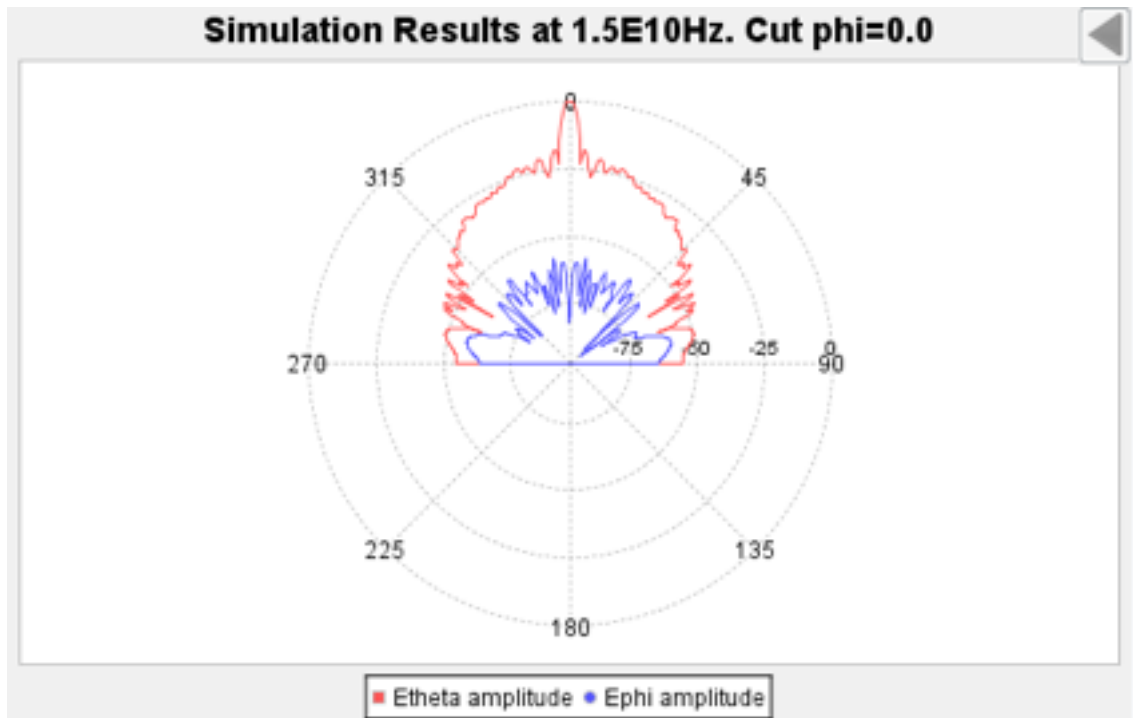


Figure 9 Cut $\phi = 0^\circ$ of the normalized radiation pattern

Select **Show Results** **View Currents**. Select units in dB and click **OK**. The current distribution will be shown in the main screen.

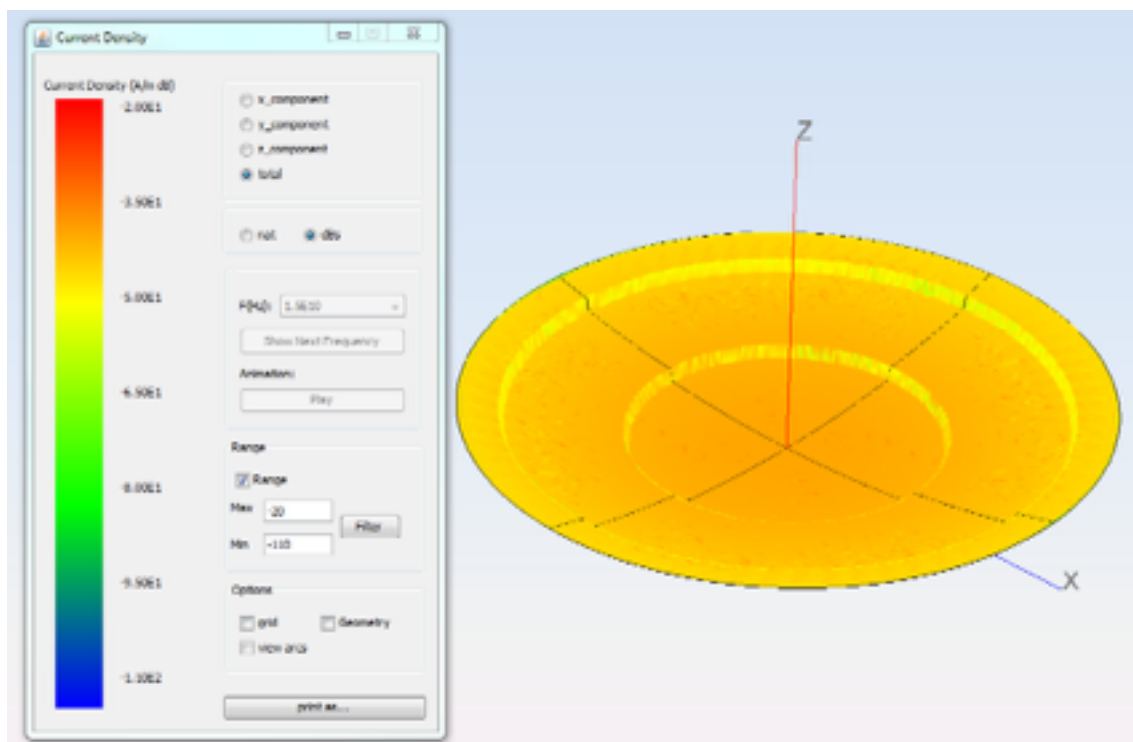


Figure 10 Current distribution in dB

Finally, select *Show Results* *View 3D Pattern* to display the 3D radiation pattern.

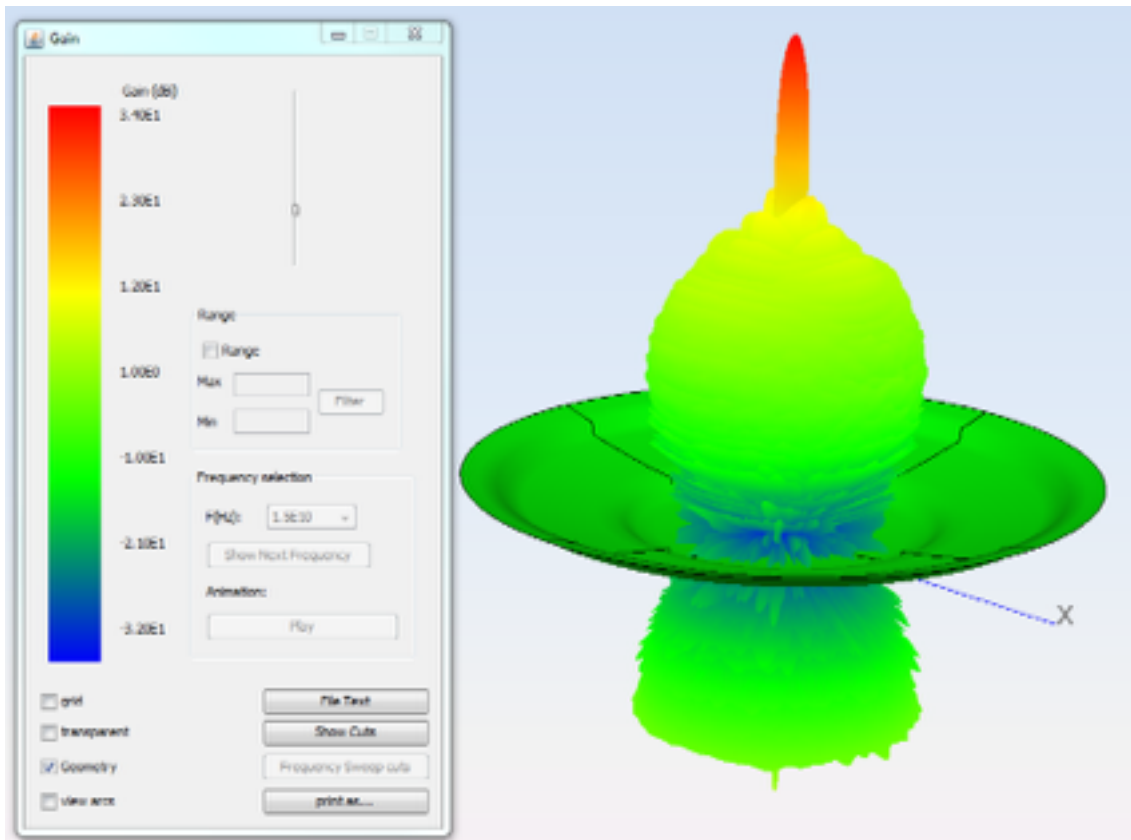


Figure 11 3D Radiation pattern