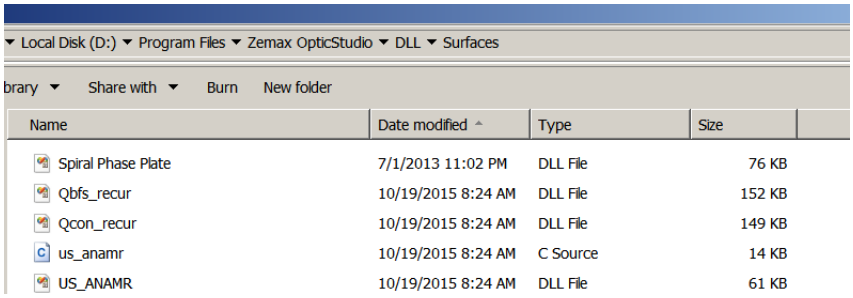
How to simulate Vortex Phase Plate in Zemax

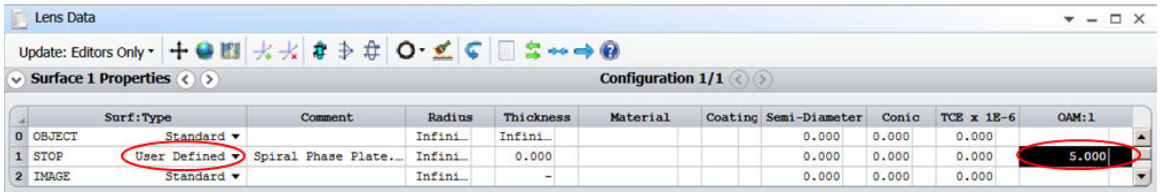
Introduction: The Vortex Phase Plate can be modeled in Zemax with special DLL file. A topological charge parameter is available on the Vortex Phase Plate surface as the first input parameter in Lens Data editor. Only Physical Optics Propagation can be applied for simulation of the Vortex Phase Plate.

Step by Step:

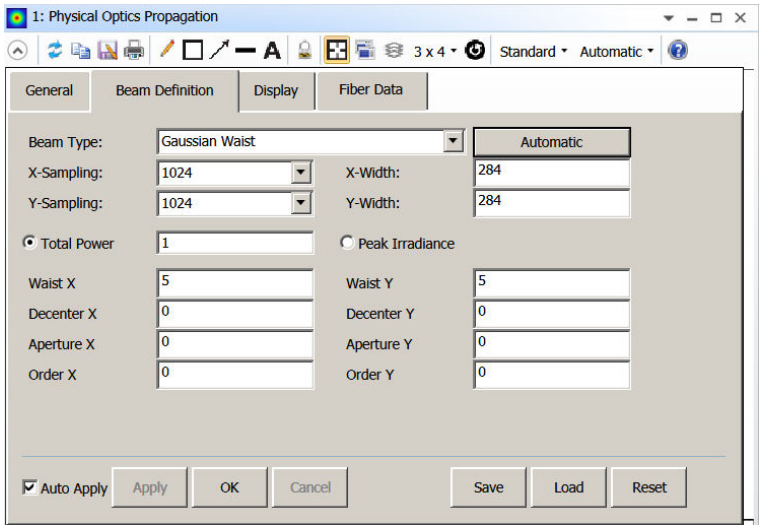
1. Download the 64-bit .dll kindly published by Dr. Moore and add it to DLL folder of ZEMAX. Example of DLL folder view:



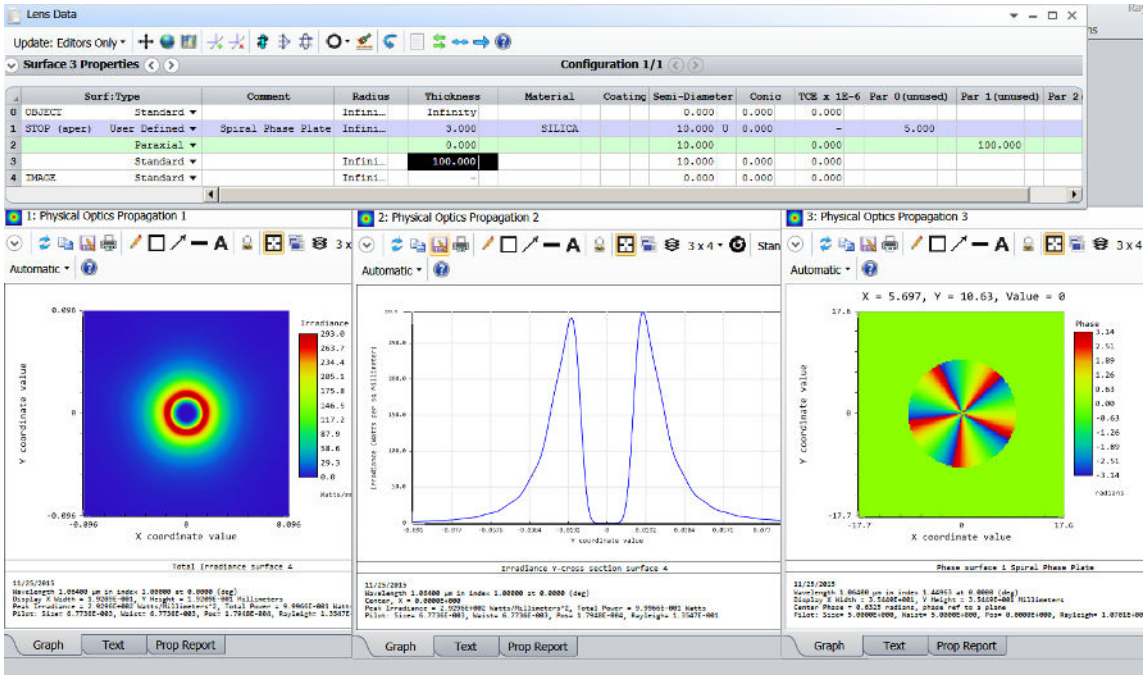
2. The DLL file should be loaded in "User Defined" surface and the user must enter the OAM charge (Topological charge) value into the first parameter of the surface.



3. Add the other important fields of your system such as wavelength, lenses and thickness.
4. Open the "Physical Optics Propagation" (POP) window, enter your Gaussian beam radius and other parameters related to your system.



5. Example of simple system with vortex phase plate and topological charge 5:



Notes: The effect of the Vortex Phase Plate can be seen only with Physical Optics Propagation

Conclusions: The Vortex phase plate Diffractive Optical Element can be modeled in ZEMAX. A full set of complex field is presented: Amplitude, Phase, and Polarization. The concept allows integrating and analyzing functionality in multi element optical systems.

Download Example file: Vortex_m5_example in Zemax Archive File extension

References:

>>>http://forum.zemax.com/Topic1739.aspx
>>>http://www.zemax.com/support/resource-center/knowledgebase/how-to-compile-a-user-defined-surface
>>>http://www.zemax.com/support/resource-center/knowledgebase/exploring-physical-optics-propagation-in-opticstud