**Tasks Completed**

1. Import Zemax lens file
   * Study structure of ZMX Files and Write the ZMX File format (about 90% complete)

* Not provided in user manual but is important to have.
* More than of about 100 ZMX commands.
* Features that can be imported automatically:
  + General Configuration data of the lens system such as System aperture, Field points, Wavelengths, Lens and Wavelength Units, Glass catalogues used.
  + Surface data such as
    - Standard data: Surface type, Radius of Curvature, Thickness, Glass, Deviation Mode, Semi diameter, (Just coating name).

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| **Surface Type in Zemax** | **Surface Type in Toolbox** |
| Standard, radius = Inf | Plane |
| Standard, radius != Inf and Conic = 0 | Spherical |
| Standard, radius != Inf and Conic != 0 | Conic Aspherical |
| Diffraction Grating | Plane (assume the plane diffraction grating surface) |
| Coordinate Breaks | Dummy with Tilt mode = NAX |
| Tilted | Plane , Spherical or Conic Aspherical based on radius and conic but with tilt mode = DAR |
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* + - Aperture Data: Aperture type (Circular, Elliptical, Rectangular and Floating), Aperture parameters. Other aperture types such as Obscuration are not supported.
    - Aspheric Data: Conic constant and polynomial coefficients
    - Grating Data: Grating line density and diffraction order.

1. Import Glass catalogues from Zemax AGF (Ascii Glass Files)
   * Support all dispersion formulas supported by Zemax so that it is possible to work with all glasses from zemax. (Such as Schott, Sellmeier, Cornady, …)
   * Automatically check the existence of used glass catalogues when importing zemax lens file.
2. Support system set up and ray trace through prism
   * Use rectangular aperture to draw 3d layout.
   * Add Dummy surface type to represent coordinate breaks
   * Modify computation of refractive index before surface.
3. Add Diffraction Grating to plane surfaces
   * Assume: Grating lines are parallel to local x axis and the substrate is plane (normal = z-axis).
   * Other orientations can be implemented by rotating and tilting the surface.
4. **4X4 Ray Pulse Matrix Algorithm**
   * Write the matrix for surface (in Kostenbouder paper the matrix for Grating and Prism are presented)
   * Computing the matrix for the whole system by tracing multiple rays.

Questions:

Zemax files for pulse stretcher, prism train, grating compressor, SSTF setup .

Zemax activation (dongo)