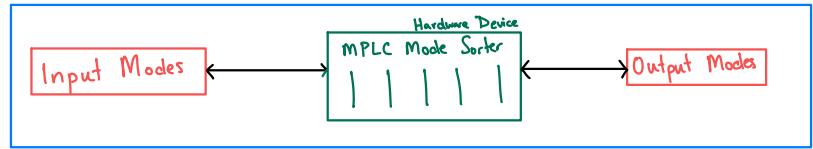


MPLC Mode Sorter Code v1

- Goals:
- Implement a basic, idealized MPLC mode sorter which will serve as the foundation for all future iterations of a realistic simulated hardware MPLC
 - Find the fixed phase mask pattern for each stage of an MPLC mode sorter to sort a given basis. This will eventually feed experimental SLM setups. And serve as an example for real-time, hardware layer code.

What is NOT in V1 (but can be added later)

- finite bandwidth
- polarization effects
- K-space filtering
- SLM Non-idealities (e.g. pixel blurring)
- Assembly non-idealities (e.g. plane spacing tolerance)
- Constraint of phase mask phases (e.g. to only quadratic or cubic)
- Physical assembly properties (e.g. reflectivity, AOI)
- Other free space elements in the hardware device
- Temporal dynamics (e.g. update rate)
- No quantum estimation update algorithms



- E-field representation
- 2D Matrices of complex #s
- Use coordinate system of simulation object
- Normalized
- Library for building Gaussian spots, LG, HG and other modes

- Linked list data object
- Distance b/w planes
- # of planes
- Aperture
- Phase Masks

- Due to reciprocity, same object type as input modes

- Wavelength
- Wavefront Matching (Free Space Propagation + Overlap Integral for Phase Mask Update)
- Grid Size (for field representation) + coordinate system
- Iterations
- Full Coupling Matrix (Transfer Matrix)
- SVD - Insertion Loss (IL)
 - Mode Dependent Loss (MDL)
- Graph Coupling, Modes, a visual of the device, phase mask patterns
- Sweep engine (e.g. # of planes, plane distance)

- What is an easy test case to make sure the WFM algorithm generates the right phase masks?

- 60h to 80h → SWE (pref. someone who has experience in quantum estimation theory)