

Turbulence Propagation Simulator Summer Goals

High-Level Goal

Architect and prototype an end-to-end optical turbulence propagation simulator built using a parallel computing architecture. This project will lay the groundwork for a propagation simulation tool that will be used by researchers in the OSC for free-space optical links.

Bronze

- Implementation of turbulence propagator in python with parallel computing (Horizontal path)
- Simplified time dynamics (translating phase screens)
- Validation of simulation output against theory for horizontal path

Silver

- Include vertical path ground to space geometry.
- Satellite tracking temporal simulation
- Validation of simulation output against theory for vertical path

Gold

- Simulate system outputs? Fiber coupling?
- Simulate adaptive optics?
- Simultaneous uplink and downlink beam simulation
- Stimulate uplink precompensation