

DRAFT

Laser Source Detection “Academic Grand Challenge”

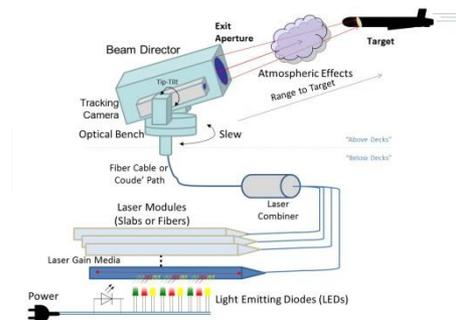
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Program Vision

Provide the Navy with multiple solutions to identify and geolocate laser sources (from Laser Comms to High Energy Laser Weapons), in part to mitigate or neutralize the damaging effects of directed energy weapon systems used against U.S. Naval Forces

Potential Study Areas supported by the Academic Grand Challenge:

- **Atmospheric Modeling and Simulation**
- **Sensing of off-axis laser**
- **Source geo-location**
- **Novel instrumentation for detection of lasers**
- **Modeling of microwave and laser effects on electronics and materials**





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Proposal:

The lack of a easily repeatable experiment, that collects and examines data from a group of known sources and sensors, that begin to teach the fundamentals of Physics, Mathematics and Computer Analysis Techniques related to Optical Systems and Atmospheric Propagation of various (low power) Laser Sources.

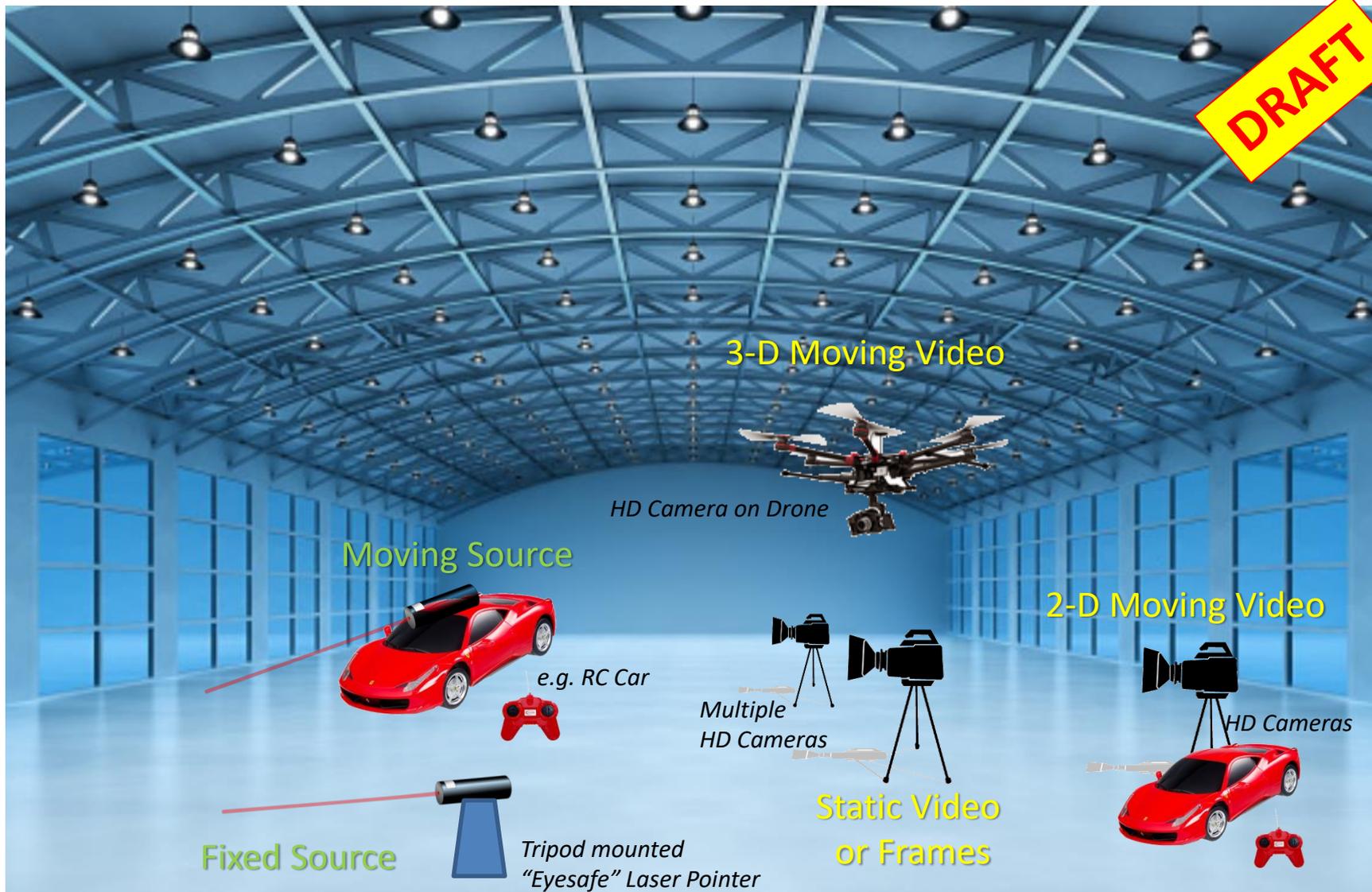
Goals:

- Increased Educational Awareness of Optics and Laser Physics
- Exposure to Experimental Equipment conducted at scale with readily available, low cost equipment (laser pointers, HD Cameras)
- Development of scientifically significant database for various sensitivity analyses comparing model and simulation to test results



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Challenge Question:

Can a one determine the location of a (static or dynamic) source (laser), including it's operating characteristics from (optical sensor) collection and platform information (dynamic or stationary) alone?

Follow on Questions:

And if so, how accurate can it be located, using only the specific data sets collected? What are the sources for error? Can the sources for error be reduced or eliminated? How does Atmospheric (absorption, scatter, etc) affect the results? How much error or missing data can be tolerated and still get statistically significant results?