Abstract

Our goal is to observe the laser light time sequence as environmental conditions change in order to determine how to best locate the direction and origin of directed-energy weapons.

Methods

- Simulate a maritime environment with a fog machine
- Propagate a laser beam through the environment and observe it from several angles
- Monitor temperature and humidity levels as well as laser intensity over time (as the fog dissipates).

Results

After a period of ten minutes, the laser projection on the board returned to full intensity. No changes to the location of the beam in space were observed. Scattering was observed orthogonally to the beam due to the smoke in the box. This experiment is not able to replicate the effects of refraction in the atmosphere.

Determining the source of a particle beam in the atmosphere is best accomplished by measuring the particles scattered orthogonally to the beam. Intensity of the source can only be determined if the distance between the source and the target is known, and conversely distance can only be determined if intensity is known in conjunction with the interference caused by the atmosphere.

References

Nanosense, P4000 Fine Particle s Probe (image)

Acknowledgements

Dr. Svetlana Avramov-Zamurovic, Professor, Weapons and Systems Department, USNA
Stephen Guth, Research Assistant, USNA