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Title

Open-Air Range Scattered Laser Light Detectors

SBIR Topic Number

AF05-313

Summary Report Type

Phase I Summary

Summation

Under the Phase I effort, a system concept was developed for providing an "optical fence" around a test range to monitor potentially hazardous stray reflections from open air high energy laser tests. The system will detect aerosol scattered radiation from stray beams, identify any detected beam's direction, and estimate its power level. Sensor and laser observables models were validated under the Phase I effort and have been used to predict signal to noise ratio for key pulsed and CW lasers. Separate pulsed and CW sensor architectures have been proposed. A concept of operations was developed for detecting the stray radiation and quickly identifying potentially hazardous situations.

Anticipated Benefits

If the optical fence system is developed, it will provide a means for identifying potentially hazardous situations associated with stray light reflections during high power laser tests. The approach can be extended to lower power laser tests as well where concern exists for stray beams or specular reflections exiting controlled areas. It will become increasingly important for test ranges to document their management of beam energy as the number of high power laser systems increases. The optical fence system provides hard evidence if any stray beams have exited the range. In addition, the laser energy monitoring approach could be useful in industrial settings that use high power lasers for welding or cutting operations and expose workers to hazardous situations if laser energy exited the controlled area in an unanticipated way.

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