



AMOR

Advanced Measurements Optical Range



Summary

- Large Optical Telescope System
- Full-Scale Targets
- Accurate Far-field Measurements
- Ladar Transceiver
- Accurate Calibration of Ladar Measurements

Advanced Measurements Optical Range is a test facility specifically designed to develop and test advanced ballistic missile defense sensing and measurement concepts.

The Advanced Measurements Optical Range (AMOR) is an indoor Laser Detection and Ranging (ladar) measurements facility designed to develop and test advanced sensing and measurement concepts for countering current and emerging ballistic missile threats. AMOR is a multifunctional facility capable of supporting Target Measurements, Sensor Testbed, Algorithm, Testing and Development, and Advanced Ladar/Passive Sensor Concept Development. The availability and use of the AMOR is vital to the U.S. national defense in supporting the development of the Ballistic Missile Defense System.

Overview

The U.S. Army Space and Missile Defense Command (SMDC) operates the Advanced Measurements Optical Range (AMOR) as a ground-based test bed specifically designed to develop and test advanced sensing and measurement concepts for countering current and emerging threats. As increasingly sophisticated missile threats emerge in the 21st century, development of advanced sensing and measurement capabilities is crucial. The availability and use of the AMOR is a vital capability for the U.S. national defense.

Benefits for Tomorrow's Defense

AMOR is a multifunctional facility capable of supporting the following vital defense mission areas for today's military, the Ballistic Missile Defense System, and the Future Force.

- **Target Measurements**—AMOR provides the capability for lidar measurements on a wide variety of re-entry vehicles (RVs), decoys, tactical, and analytical targets. A proven track record of target measurements ensures fully characterized measurements of new targets.
- **Sensor Test bed**—AMOR is an excellent lidar sensor test bed from visible to long-wave infrared wavelengths. Flexibility in the AMOR facility design allows integration and testing of a wide variety of Laser Detection and Ranging (lidar) sensors.
- **Algorithm Development and Testing**—Range-Doppler images, range resolved target cross-sections, and total cross-sections of realistic targets undergoing actual spin and precession motion provide essential data input for discrimination algorithm development and testing.
- **Advanced Lidar/Passive Sensor Concept Development**—Advanced sensors with both lidar and passive capabilities will be required to counter both current and emerging missile threats. AMOR is a unique test bed for developing lidar/passive sensor concepts.

Technical Concept

AMOR is an indoor lidar measurements facility possessing several unique features. The following are specific utilities within the national defense arena.

- **Optical Aperture**—The AMOR large optical telescope system features a two-meter diameter primary mirror which provides the capability for AMOR to make realistic lidar measurements of full scale RVs and decoys as well as tactical targets and munitions.
- **Target Motion**—The AMOR target mount provides realistic target motion of full-scale strategic type targets. The target mount can hold targets at aspect angles continuously variable from 0 to 90 degrees, as well as providing spin and target wobble.
- **Far-field**—The AMOR optical system provides the capability to take the output of a transmitter and produce a high quality collimated beam of about two meters in diameter, which provides an illumination of the target with the characteristics needed for far-field measurements. The optical system also provides the necessary optics to collect scattered radiation from the target with a very narrow angular field-of-view to complete the far-field simulation. Variable range capabilities also include an optical zoom system for fly-in-simulations using active or passive sensors.
- **Lidar Transceivers**—AMOR receivers can make coherent (heterodyne detection) and incoherent (direct detection) measurements. Wide-bandwidth waveforms allow detailed target signature measurements.
- **Calibrated**—All lidar measurements are calibrated using specularly reflecting spheres of known cross-section.



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Distribution A

1004/0141