

Technical Services

Precision Sensing, Measurement and Controls

The Advanced Surveillance Technologies for Research, Analysis and Lasers (ASTRAL) contract is aimed at performing in-house research, development, and demonstration of technologies associated with current and advanced concepts in Active and Passive Imaging, Pointing and Tracking Systems, Beam Propagation, Airborne Imaging and Designation, Lidar, and Remote Sensing. ASTRAL provides rapid and complete qualitative and quantitative performance prediction and evaluation for Air Force Research Laboratory (AFRL), Missile Defense Agency (MDA), Department of Defense (DOD) and associated organizations imaging, laser, and beam control systems. This service includes laboratory and field support of imaging, sensing, Lidars, designation, atmospheric and propagation, as well as developing new concepts in these areas.



Warball Development

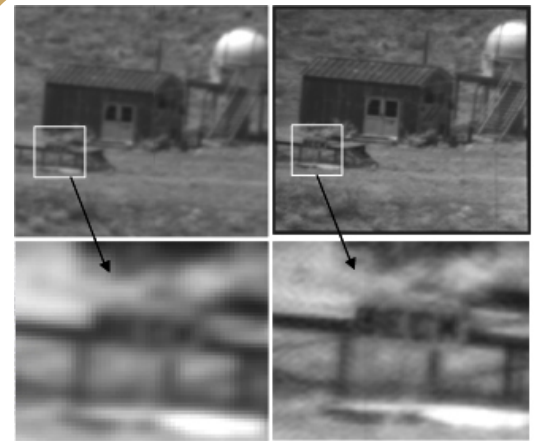


Support efforts consists of computer modeling and simulation of beam control, Lidars, imaging and sensing systems experiment design and construction; experiment data collection, reduction, and analysis; and technical support for imaging and optical systems analysis. Computer modeling and simulation are performed on existing experimental systems as well as proposed, more advanced, beam control systems for design analysis and performance prediction. Design and analysis software tools shall be modified and developed to support these modeling, simulation, data reduction and analysis efforts. In addition, efforts encompass all phases of ground based and airborne imaging and propagation experiments, including laboratory and field experiment design, integration and troubleshooting, computer systems and image processing workstation integration and operation, data acquisition for both system hardware procurement, and analysis for laboratory and field experiments, as well as algorithm development, and performance prediction analysis. ATA has upgraded existing experimental setups with new sensors, made design changes to sensors, simulated and analyzed experiment performance, collected and reduced data, and upgraded existing data collection systems.

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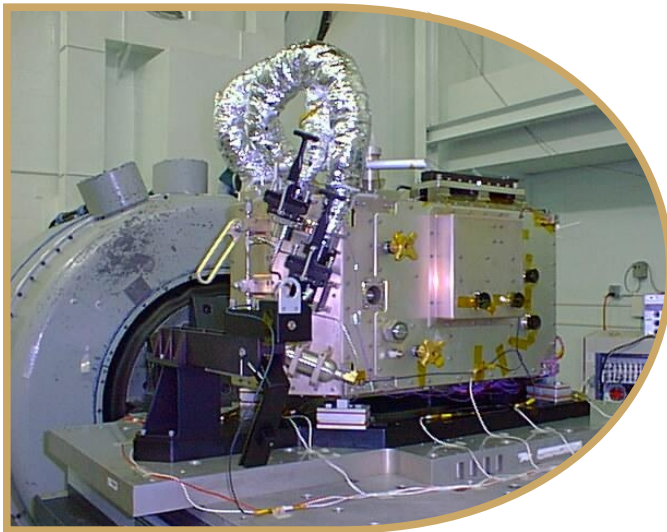
Laser Beam Control

The AFRL performs fundamental research and development on precision imaging, Lidars, optical sensing, beam control, remote sensing, and laser propagation in the presence of atmospheric degradation. Experiments designed to understand high resolution imaging for Space Object Identification (SOI); for Airborne, and Space-based sensor and Lidar systems; for high energy laser propagation and the improvement of image resolution in the presence of atmosphere are currently underway. Imaging, Lidars, and beam control for a high -energy laser systems and other DoD applications requires extreme tracking precision against dynamic targets with widely varying signal-to-noise ratios. Each segment of the propagation and imaging system involves careful testing and analysis in both the laboratory and the field in battle environment. This requires management of the data collection, rapid data analysis, and the availability of accurate modeling, simulation, and analysis tools that have been delivered under this contract.



Raw Image Post-Processed

Cryogenic Research



The Cryo-Cooler Research Engineering Analysis Technology Effort (CREATE) is to provide the Space Based Technology Branch (AFRL/VSSS) of the Space Vehicle Directorate (VS) cryogenic and thermal management systems, experimental and analytical investigations related to the Cryogenic Technology Group (CTG). The technical efforts are focused in areas supporting in-house research, development, operation and characterization testing of cryogenic cooling technologies. Our efforts evolve and implement innovative methods to increase efficiency, to extend characterization information to achieve shorter characterization times, and provide positive direction to the cryogenic research programs supported by the Air Force and the CTG.

Specifically, we plan and execute various required cryocooler characterization tests, acquire and analyze data, and present findings to CTG's scientific community and industry. In addition, we develop and document software and algorithms, perform modeling and simulation, plan and execute electromagnetic interference (EMI), electromagnetic compatibility (EMC), and shock and vibration tests to characterize performance for the advancement of cryogenic cooler technology and compatibility. ATA also participates in mechanical aspects of laboratory characterization development, which necessitates understanding of the overall goals of the CTG in regards to test setup, designing, building, maintaining environmental test stands, support equipment, vacuum systems, data acquisition systems, computer systems to the required specifications. Data collected during testing provide information related to characteristics and performance of various cryocoolers and their interface.

Cutting Edge Technology in Sensing and Controls

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