Signature Measurements

State-of-the-art measurement and diagnostics:

Measurements:

- Chamber
- Static
- Sled
- Launch
- Hover
- Free-Flight
- Turntable

Characterization:

- Plume Signature
- Target Signature
- Muzzle Flash
- Intercept Temporal
- Flowfield Properties

National Institute of Standards and Technology (NIST)-Traceable Calibrations

Standardized Calibration and Measurement Processes

Field Digital Data Collection, Data Processing, and Quick-Look Products: Mission + 3 hr

AMSC operates portable trackers and a fixed-site tracker at PMRF/Ni'ihau

EO-IR Capabilities:
Spatial, 0.2—12 μm
Spectral, 0.12—20 μm
Temporal, UV—LWIR

Field-Tested Intrusive and Nonintrusive Diagnostics:

- Temperature & Pressure Probes and Rakes
- Laser Extinction & Backscatter
- IR Emission/Absorption, UV Resonance Absorption

Hosted at the Arnold Engineering Development Center, on Arnold Air Force Base, in Tennessee, the 718th Test Squadron is one hour from the major missile defense research and development offices located in Huntsville, Alabama.

The AMSC was formed in 1989 as one of three Strategic Defense Initiative Organization phenomenology data centers and continues today as a customer support site within the Missile Defense Agency reengineered Data Center Program.

Advanced Missile Signature Center
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Arnold Engineering Development Center

Advanced Missile Signature Center

718th Test Squadron

Providing data management services, EO-IR diagnostics and target signature collections, plume modeling and simulations, and signature subject matter expertise to DOD since 1989.

www.arnold.af.mil/units/amsc.asp

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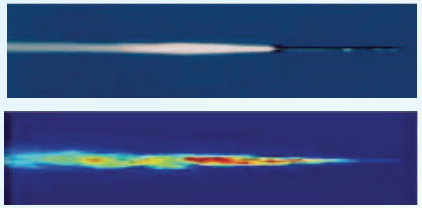


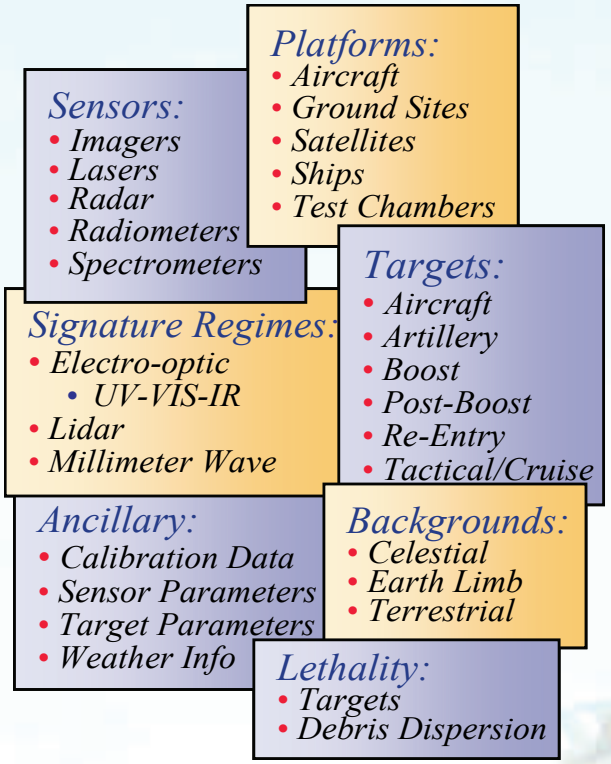
Data & Analysis

Staff analysts assess and evaluate data sets archived within the facility. Analysts check the data for self-consistency, perform cross-comparisons of various instruments that observed the same target, and evaluate data utility to develop and apply knowledge of observed signature phenomena. Data are processed for atmospheric, flow field, and plume radiation effects.

The AMSC maintains a complete and current suite of government standard reentry and boost signature codes for modeling and simulation. The AMSC is actively involved in the continual refinement and evaluation of the models against measured missile body and plume data, in an effort to provide more reliable signature estimates to the missile development community.

Emerging analysis & simulation capabilities:

- Application of super-resolution, image de-jittering, and wavelet-based enhancement tools
- Generating plume signatures within a 3-D model extrapolation framework to produce a hypercube of spatial and spectral predictions anchored to data
- Simulating plume temporal fluctuations using empirical hyperspectral image analysis techniques



Subject Matter Expertise for:

- Specialized Data Processing
- Data Assessment and Reporting
- Image Enhancement
- Digital Hyperspectral database development
- Analysis of sputtering intensity levels
- Analysis and Modeling Tool Application and Development
- Bibliography Searches
- Advising Users on Data Availability and Caveats
- Data Ingestion, Archive, and Distribution
- Web Site Hosting and Maintenance

Video Services

The AMSC Imaging Lab was designed to support the ingestion/archive of experiment video/film data and to provide a quick post-production capability for rapid generation of video presentations. The system will support digitizing to all current formats, duplication between all major video formats, and archiving to uncompressed digital image sequences. The lab also supports composing post-mission data tapes for presentation and analysis purposes.

The all-digital video/audio post-production facility can support all of the typical production operations:

- Nonlinear editing, broadcast quality titling, & compositing
- Side-by-side, quad image, & multiple time-registered video sequences & simulations
- Film digitization (16/35/70 mm)
- Automated object tracking tools
- Image processing & enhancement, including noise removal, background processing, motion compensation
- Playback & recording of all broadcast standards
- Multimedia authoring, including MPEG-1 or -2 on CD-R, video-CD, and DVD