



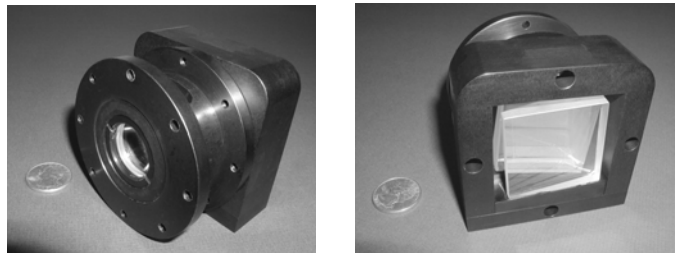
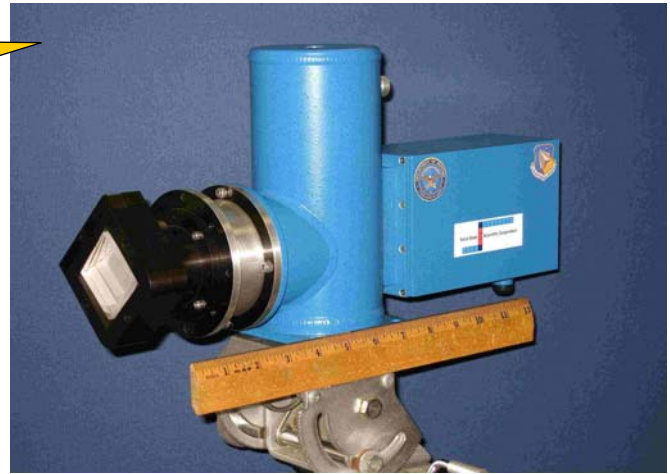
Spectral-Temporal Sensor

Simultaneous Visible-SWIR-MWIR Pseudo-Imaging

Detect, Locate, Discriminate, and Identify Energetic Point Sources in Real Time!

The simultaneous VIS-SWIR-MWIR Spectral-Temporal Sensor (STS) is a unique **fast-framing**, Pseudo-Imaging (PI) sensor that resolves the time evolution of **flame**, **plume** and **flash** source spectra. Point-like dynamic events are mapped onto the focal plane as a linearly-dispersed image of their spectral content. In operation, each frame is a snapshot of the event spectrum, where the spectrum contains **more than two hundred colors** from the visible *through* the MWIR bands.

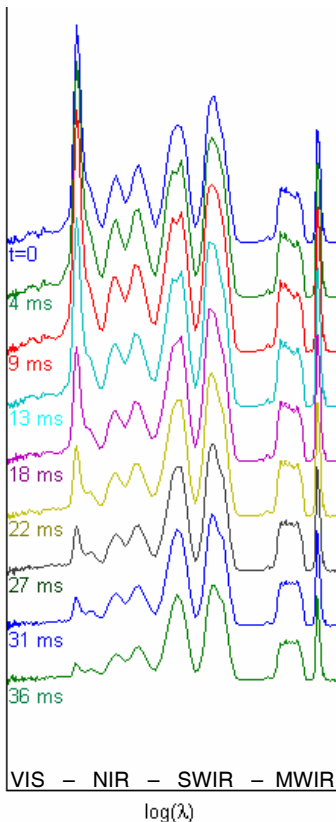
In addition, the unique design of the optics makes the system capable of locating the position of the source with **sub-pixel precision**. All this within a small sensor package without moving parts!



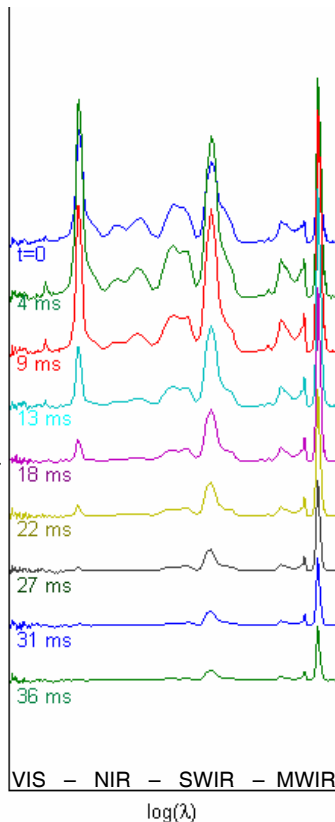
Second Generation Optics

Applications

Sample Howitzer Signature



Sample Mortar Signature



Detect, Locate, Track, Discriminate, Classify, Identify

The STS combines fast-framing measurements of *spectral-temporal signatures* with *real-time discrimination algorithms* for:

- Personnel Protection
- Missile Threat Warning (MTW)
- Dynamic Battle Damage Assessment (BDA)
- Reconnaissance and Surveillance
- UAV Battle Assessment
- Launch Detection
- Counter-Countermeasures
- Space Situational Awareness (SSA)
- Anti-proliferation Monitoring
- Combustion Analysis
- Plume Phenomenology Studies
- Munitions Development

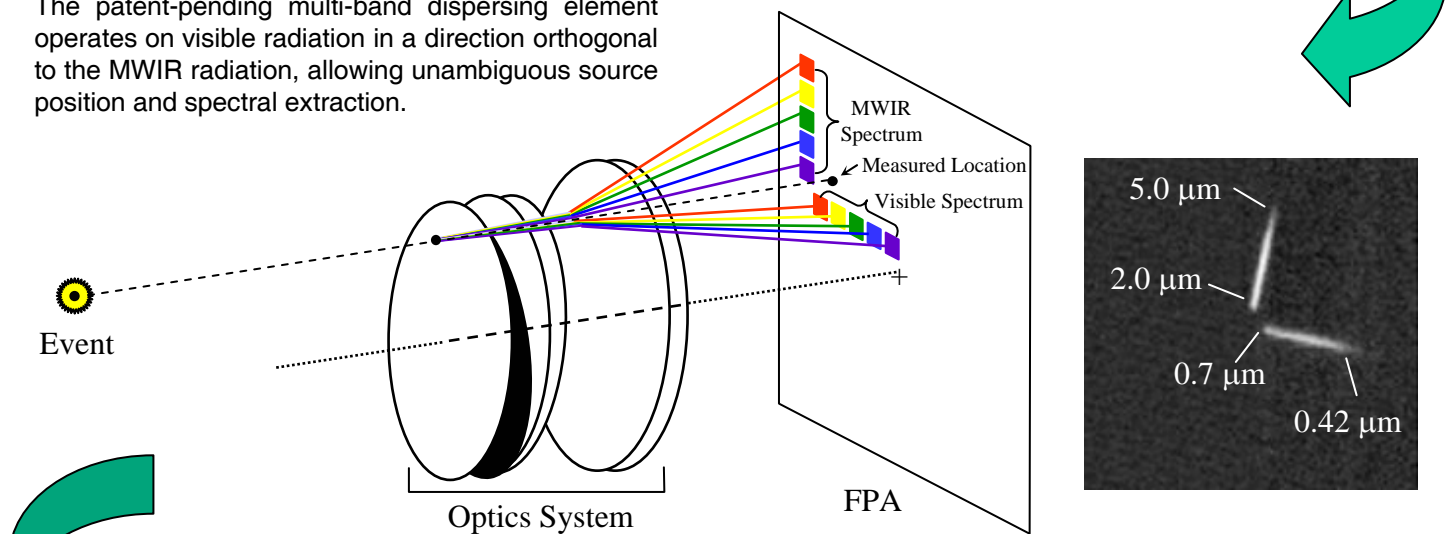


Typical Spectral-Temporal Pseudo-Imaging Targets

- Small Arms Fire
 - AAA
 - Artillery
 - SAMs
 - Missile Plumes
 - Rocket Plumes
- Bomb Explosions
 - Real-time BDA
 - Secondary Explosions
 - Burning Debris
 - Aircraft Exhaust
 - Any Energetic Point Target

Sensor Operation

The patent-pending multi-band dispersing element operates on visible radiation in a direction orthogonal to the MWIR radiation, allowing unambiguous source position and spectral extraction.



Results

Automated, Real-Time Processing For Spectral-Temporal Data

- Event Detection
- Signature Extraction
- Event Classification

**Detect, Locate,
Discriminate,
and Identify!**

Sensor Specifications

- | | |
|--------------------------------------|---|
| • Approximate Size: | Height 6" Length: 20" Width: 10" |
| • Approximate Weight: | 25 lbs. |
| • Spectral Range: | 500 nm through 5 μm |
| • Spectral Resolution: | 200 bands or more (sampled within the spectral range) |
| • Camera Frame/Spectral Sample Rate: | 450 fps @ 256×256 pixel resolution; 117 fps @ 512×512 |
| • Array Type: | InSb |
| • Maximum Array Format: | 640×512 pixels |
| • Data Dynamic Range: | 14 bits |
| • Refrigeration: | Liquid Nitrogen |
| • Optical Speed: | f/4.0 |
| • Field of View | 12° for Second Generation System; 6° for First Generation System. |

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