

# SOLID STATE SCIENTIFIC CORPORATION

BATTLEFIELD EVENT ISR SENSOR FOR UAV PLATFORMS (UAVCDP2)



Battlefield Event ISR Sensor Prototype for UAV Applications

## About the Technology

Military and commercial aircrafts are vulnerable to attack from a wide variety of guided and unguided rockets and explosive projectile threats. The ability to correctly identify propulsion systems and missile types in real time allows the Navy to effectively institute countermeasures and tactics against threats and enhance the situational awareness of the battlespace. To address this need, Solid State Scientific Corporation developed the Battlefield Event Intelligence Surveillance Reconnaissance (ISR) Sensor that uniquely identifies rocket motors and explosive initiated projectiles, and allows the reliable identification and location of a projectile launch as a passive sensor. The Battlefield Event ISR Sensor measures 260 simultaneous spectral bands from energetic battlefield transient events over a relatively wide field of view. The sensor utilizes an optical element called the crossed-dispersion prism, which simultaneously projects the Medium-Wave Infrared (MWIR) and either the Visible (VIS) or Short-Wave Infrared (SWIR) spectra of point targets onto a common Focal Plane Array (FPA).

The Battlefield Event IRS Sensor is designed to have the VIS/SWIR and MWIR spectra display at a right angle on the FPA, allowing the system to spectrally self-calibrate and provide sub-pixel accuracy in the location of point target events. The Air Force sponsored tests, conducted at Yuma Proving Ground, for automated detection, spectral extraction, event classification, and identification algorithms. The Battlefield Event ISR Sensor was successfully demonstrated in tests against live targets onboard a NAVAIR AeroStar Unmanned Aerial Vehicle (UAV).

## Military and Commercial Significance

The Battlefield Event ISR Sensor provides intelligence about battlefield events such as rocket launches and anti-aircraft artillery. The sensor includes a multi-band electro-optic camera and customized processing that quickly detects, locates, and identifies battlefield events in real time. Unlike traditional high-resolution broad-band imaging sensors that have limited discrimination capability and require large communication bandwidths, the Battlefield Event ISR Sensor provides location and identity information in a text message within seconds of each event.

## APPLICATIONS

- NAVAIR: PEO Weapons UAV - Battlefield Event ISR
- NAVAIR: PEO Air Assault & Special Missions Program -Missile Threat Warning and Threat Identification; Targeting
- NAVAIR: PEO Weapons- Real-time Bomb Damage Assessment

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Topic Number: N03-008  
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SBIR Investment: \$850K  
Project Revenue: \$5.5M

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## About the Company

Solid State Scientific Corporation (SSSC) researches and develops high-throughput spectral imaging and pseudo-imaging sensors and algorithms for defense applications. Since 1994, SSSC has designed, built, and tested advanced prototype hyper spectral imaging systems for a range of military electro-optic infrared applications in the visible/near infrared, SWIR, MWIR, and long-wave Infrared bands. SSSC has pioneered simultaneous spectral-temporal sensing for real-time identification and tracking of energetic battlefield events for such applications as missile threat warning, bomb damage assessment, situational awareness, and launch detection.