EWA Government Systems, Inc.
Enabling a more secure future
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ELECTRO-OPTICS LABORATORY (EO LAB)

UV/IR Radiometers, Sensors, Sources and Test Equipment

DESCRIPTION

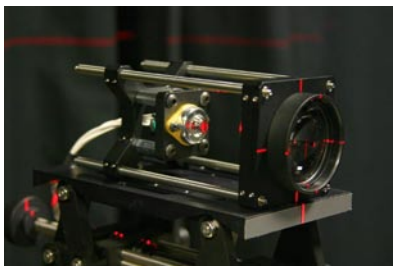
EWA-GSI currently supports an expanding in-house capability involving state-of-the-art ultraviolet (UV) sensor and source technologies. Additionally, our **Electro-Optics Laboratory** (EOLAB), located in a secured area of the EWA facilities, provides a thorough and complete complement of the necessary calibration instruments and support electronics. The lab is divided into three main areas: 1. **Radiometer/Sensor Bay**; 2. **Source & Spectrometer/ Monochromator Bay**; 3. **Test Control & Analysis Bay**

CAPABILITIES

Custom Electro-Optical/Opto-Mechanical Design & Fabrication

Provide optical and opto-mechanical design and analysis including: lens design, custom lenses (UV through LWIR), lens and mirror mounts, non-imaging optics, laboratory prototypes, optical simulations and breadboards, optical and laser system alignment, and specialized test instrumentation. Design tools include MATLAB, OptiCAD, Geomagic (Alibre) CAD, Pro E and AutoCAD.

Custom Programmable UV & Infrared (IR) Sources Design & Fabrication



Design, fabricate and characterize a variety of programmable single spectral band and multi-spectral sources. These systems include Deuterium (D2), Quartz Tungsten Halogen (QTH) and LED emitters coupled with custom fiber optic, reflective and/or refractive optical output elements. These systems are ruggedized and designed as field instrumentation.

Custom UV Witness Sensors & Data Acquisition

Design, fabricate and test high resolution, high speed UV irradiance monitoring (witness) sensors with integrated data acquisition and processing. These sensors are developed independent of, or in conjunction with, the programmable UV/IR sources described above. Standard implementations include digital signal processing and waveform display applications.

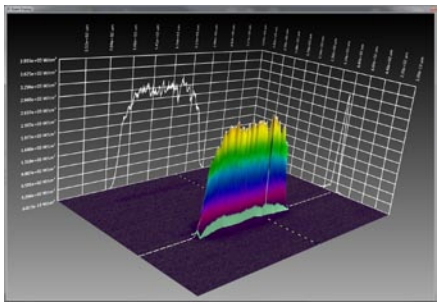
Directed Infrared Countermeasures (DIRCM) Detection and Evaluation System (CD/E)

Design, fabricate, characterize and operationally test multi-channel DIRCM laser system in an optically shielded environment. These systems characterize the DIRCM laser stimulated responses in four or more IR spectral bands. Each spectral channel is sampled at a 100 kHz rate to ensure non-aliased data acquisition and digital signal processing. These systems can interface directly with existing Department of Defense (DoD) test range infrastructures, and provide complete hardware-in-the-loop (HITL) functionality for Operational Test and Evaluation (OT&E) of installed sensor hardware.

High Resolution (Sub-nanometer) Source & Sensor Characterization

Maintain an engineering research and development (R&D) laboratory providing multi-spectral characterization of both sources and sensors at sub-nanometer resolution. This includes using monochromators and spectrometers, NIST-traceable UV and IR reference sources and blackbodies, laser alignment (when necessary), optical workbenches/breadboards and light-shielded, temperature controlled laboratory conditions.

Laser Beam Characterization

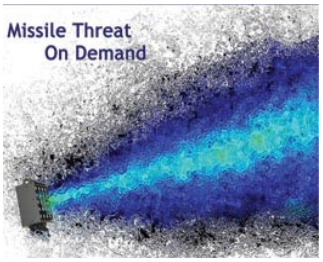


Characterize and test UV, Visible and IR lasers as required. Standard measurements include laser transverse mode, beam radius/diameter, spatial intensity distribution or beam profile, divergence, quality factor (M^2), laser average power and operational assessment.

Remote Electro-Optic Telemetry

Design, fabricate and operationally test radio frequency (RF) networked electro-optic telemetry systems. These systems are tagged using global positioning systems (GPS), and feature a central monitoring station networked to synchronized, environmentally shielded electro-optic sensors located at ranges of up to 5 km. The remote sensors can operate unattended in typical field conditions, and can handle a wide range of temperatures.

Scalable UV Missile Plume Simulators



Design, fabricate and operationally test UV missile plume simulators. These scalable systems feature adjustable output power levels suitable for small, handheld units used to test missile warning system (MWS) sensors on the flight line, to large, multi-element UV light emitting diode (LED) arrays for testing tactical aircraft at ranges up to 5 kilometers (km). These systems are fully characterized in terms of wavelength, beam width, shape and radiant intensity. They feature update rates in excess of 200 Hz, and offer either linear current and/or pulse width modulated (PWM) output intensity adjustment. The systems offer remote profile access and triggering capability. The missile plume simulators feature removable memory for missile plume libraries, with each library holding up to 100 profiles. Maximum profile durations are in excess of 5 minutes. A set of test profiles is provided, and a stand-alone MATLAB application for developing additional profiles is also included. These systems are lightweight, tripod mountable and robust, and are designed for routine field use.

Ultraviolet (UV) Imaging Radiometers (ICCD, IPD, EMCCD)

Design, fabricate and characterize high speed/high resolution UV imaging radiometers in the spectral region from 250nm-300nm. Integrated sensors include Intensified Charge-Coupled Devices (ICCDs), Imaging Photon Detectors (IPDs) and Electron Multiplying Charge Coupled Devices (EMCCDs). These systems all feature narrow band solar blind filters (SBF) at specified wavelengths. Also included are custom UV optics at multiple focal lengths, neutral density filters (NDF) with a variety of optical densities, custom tripod mounts and imager carriage assemblies, and spotting scopes. These systems optionally feature ruggedized notebook computers.

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