Compact, Ultrasensitive Formaldehyde Monitor

Novawave Technologies

Technical Abstract
The Small Business Innovative Research Phase II proposal seeks to develop a compact UV laser based sensor for Earth science and planetary atmosphere exploration. The device will be capable of measuring formaldehyde in real-time at ultra-trace levels. The sensor is based on a revolutionary, single frequency tunable UV fiber laser that was successfully demonstrated for the first time during Phase I. This laser was mated with a detection cell and high fidelity formaldehyde spectra were obtained. The Phase II sensor will be compact and capable of detecting formaldehyde at ppt levels, and may be capable of simultaneously detecting NO2, an important pollutant.

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2007 Phase II
Proposal S1.08-8517

In Situ Airborne, Surface, and Submersible Instruments for Earth Science

Airborne Wide Area Imager for Wildfire Mapping and Detection

Xiomas Technologies

Technical Abstract
An autonomous airborne imaging system for earth science research, disaster response, and fire detection is proposed. The primary goal is to improve information to researchers and operations personnel. By operating autonomously and with higher spatial resolution, the system will deliver a 3X to 4X reduction in operating costs compared to current systems. The system uses a two color Quantum Well Infrared Photo detector (QWIP) to improve the accuracy of energy release from wildfires, thereby improving our understanding of the carbon cycle. The system includes a multi-sensor step-stare imager, position and attitude sensor, data communications link, and a data processing system with; feature extraction (such as fire detection), image geo-coding, and image compression. The sensor head is an innovative design combining high resolution framing devices (cameras) with a step-stare scanning mirror. This configuration results in high spatial resolution imagery and wide area coverage. The design of the sensor head is flexible allowing for a variety of imagers including; visible and IR cameras and/or hyperspectral sensors. We envision several versions of the instrument, one weighing around 75 pounds and a smaller version weighing less than 15 pounds.

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