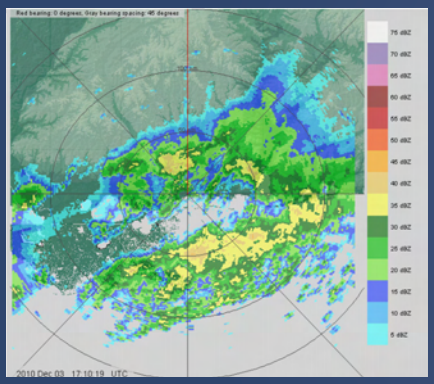
Navy SBIR/STTR Success



Modular Software Architecture for Advanced Weather Radars

MSA provides non-interfering real-time weather radar data and imagery using tactical radar assests, enhancing the accuracy of weather prediction models and resulting in more accurate and timely weather forecasts for forward deployed forces.

Topic Number: N06-072

SBIR Investment (Phases I and II): $571,723

Phase II Investment (non-SBIR funds): $2,539,056

Phase III Revenue: $6,645,851

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About the Technology:

Many naval vessels deployed around the world often lack organic weather radar information, which is crucial in improving operational effectiveness and efficiency, as well as preventing accidents. Satellite sensors and receivers can provide near real-time weather information, but this information is often not continuously available. To address this issue, BCI has developed a weather radar processing system that is used to add advanced capability to existing tactical radar systems. The Modular Software Architecture (MSA) allows for the use of one common radar processor across different tactical radar systems. The MSA utilizes common processing modules that are linked together with a common radar data format to reduce custom code development for each radar application. Additionally, the MSA provides a low-cost adjunct weather processing capability to tactical radars by extracting weather data from the raw radar returns in parallel, without interfering with the radar's tactical mission. Weather information updates are provided at intervals of up to once per minute.

Naval Benefit

MSA enables battlefield, airborne, and naval radars to provide enhanced weather information over the entire operational theater. Utilizing existing and developmental tactical radars deployed in substantial numbers to combat zones can help expand the coverage of the dedicated weather radars for little added cost and without the need to add additional sensors. The MSA is essentially a set of radar processing algorithms that are designed to interface with a common raw radar data structure. This allows a Through-the-Sensor (TTS) weather processor to be developed for a tactical radar system using a set of pre-developed processing algorithms, and minimizes the need to develop, integrate, and test a custom processor each time a new radar is to be outfitted with the weather processing capability. By adapting this technology to accommodate all tactical radar systems, BCI has reduced the need for a variety of weather processing systems.

Transition

The modular nature of the MSA software is constantly being upgraded with new processing algorithms and display capabilities, as well as new interfaces to additional radar systems. The SPS-48E/G Hazardous Weather Detection and Display Capability (HWDDC) processor, of which the MSA is the backbone software component, is currently fielded on 12 CVN and L-class ships. The MSA technology is used in the SPY-1D radar's Tactical Environmental Processor (TEP) being designed and built for installation on DDG-51 Arleigh Burke class destroyers as part of the Aegis Modernization upgrade. The US Air Force has also purchased 30 weather processors, which are based on the the MSA architecture, for the TPS-75 radar. These Air Force systems are currently in production and will be delivered throughout 2013; the first system is operationally deployed in Al-Udeid, Qatar.

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