NAVY Transition Assistance Program

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N07-014 - Applied Physical Sciences Corp.

Sonobuoy System and Concept of Operations for Time-Reversal-Based Target Detection

NEED & CUSTOMER REQUIREMENT

Need: A requirement exists for improved detection capability for the airborne ASW mission. The goal of this project is to improve detection of low-target-strength submarines in shallow water using Time-Reversal-Barrier (TRB) techniques.

Value to the Warfighter: Stealthy targets are often able to evade detection by sonobuoys due to their low back-scatter target strengths. TRBs take advantage of the higher forward-scatter target strength to improve the likelihood of detection.

Operational Gap: Current multi-static sonobuoy approaches cannot take advantage of the strong forward scattering from the target due to the blinding presence of the direct blast from the source (the 'looking into the sunlight' problem).

Customer Specifications: (1) The system must be practical for deployment on a typical A-size sonobuoy and (2) system performance must provide tactically useful barrier lengths.

Technology Description: The TRB approach makes use of two sonobuoys, one source and one receiver, to form a barrier or tripwire. When a target crosses this barrier its forward scattered field leads to a detectable change in the time-reversed signal.

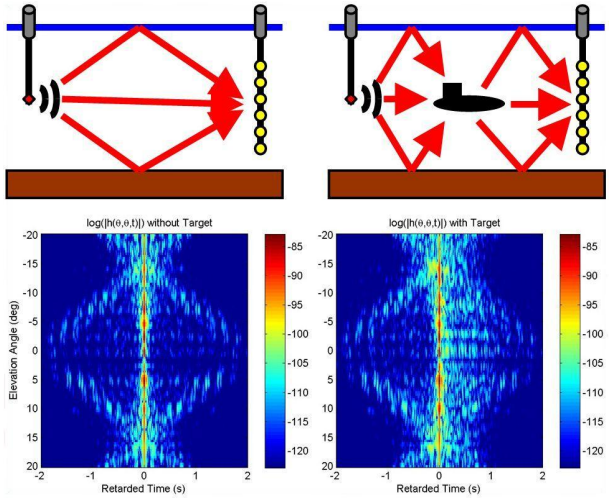
SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: NAVAIR

Transition Target: Coherent Active Source and Digital Vertical-Line-Array Receive Sonobuoys

Original Sponsoring Program: PMA 264 Multistatic Anti-Submarine Warfare Systems

TPOC Phone Number:
(301) 342-2121



TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Acoustic Simulation and Analysis	6	Low	Performance Predictions	Nov 2007
System Development for Sea Testing	6	Moderate	System Test	Feb 2010
Sea Test	7	Moderate	Performance Metrics	Dec 2010
Production System Development	8	Moderate	System Test	2012

Open contract: N68335-09-C-0084 ending Jan 12, 2011

TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications:
Legacy and new fixed wing maritime patrol aircraft and helicopters. Other ASW systems.

Business Model:
Refine requirements with NAVAIR PMA 264. Work with USSI during Phase II to implement and test a prototype TRB system using existing sonobuoys. Enter into discussions with the ASW aircraft prime contractor to plan for software implementation into the onboard sonobuoy processor.

Objective:
Develop a TRB system using existing source and receive sonobuoys and existing sonobuoy processing systems.

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