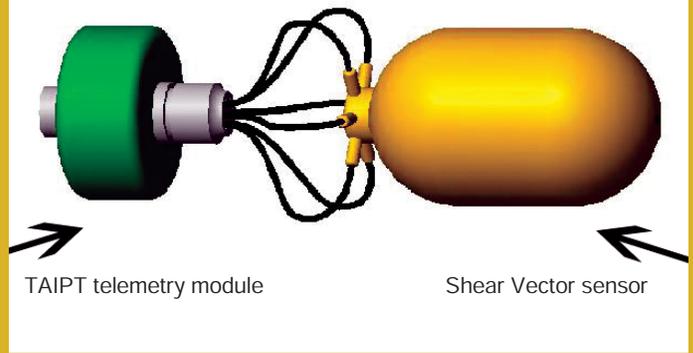




WILCOXON RESEARCH, INC.

SHEAR MODE VECTOR SENSOR WITH ARRAY COMMUNICATION ELECTRONICS



Shear Vector Sensor with Telemetry Module

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Topic Number: N02-066
(ONR)

SBIR Investment: \$700K
Project Revenue: \$3.98M

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About the Technology

For many years towed arrays have been utilized by the Navy’s submarine fleet to detect underwater acoustic signal. Currently existing arrays employ omni-directional hydrophones which cannot determine if the signal is emanating from the left or right side. To determine the bearing of the detected signal, the submarine must conduct maneuvers which change the position of the array so that the bearing to the target can be triangulated. These maneuvers take time and often the detected signal is lost. Directional information can be achieved by towing multiple arrays behind the submarine but these systems are difficult to deploy and retrieve and are costly to implement.

Wilcoxon Research, Inc. has developed an advanced towed array sensing technology that uses the single piezocrystal to create an acoustic Vector sensor that meets the submarine community’s directional sensing needs. The neutrally buoyant sensor combines an omni-hydrophone with a tri-axial accelerometer. The hydrophone detects a target’s acoustic pressure and the accelerometers detect the target’s directional acoustic particle velocity. Wilcoxon’s Shear Mode Vector Sensor has been tow tested at the Navy’s Lake Pend Oreille facility in Idaho. It has also been tested at sea in California’s Monterey Bay as a towed array behind a Unmanned Undersea Vehicles (UUV) and as a bottom mounted array.

Military and Commercial Significance

Wilcoxon Research’s low noise Vector sensor can be rapidly integrated into existing Naval towed array applications. Unlike existing omni-directional hydrophones, the Vector sensor provides directional information on target noise sources. The acoustic Vector sensor eliminates left/right ambiguity while providing a bearing accuracy of 1 degree and 4.8 - 6.0 dB of gain of amplification over traditional hydrophones. The sensor’s null can be steered in any direction to reduce noise interference, thereby increasing signal to noise gain and allowing increased resolution of faint acoustic signals. The sensor can also be used in sea life studies to determine behavioral patterns.

About the Company

Wilcoxon Research, Inc. is committed to the ongoing evolution of pioneering research and development in advanced piezoelectric transducers. The company manufactures a wide range of vibration instruments, and manufacturing and test equipment ranging from basic precision machinery for providing high quality sensor components, to custom-built machinery specifically designed for transducer fabrication. Wilcoxon’s extensive engineering experience and manufacturing expertise provide a solid foundation on which to design and build the products of tomorrow.

APPLICATIONS

- Navy -Towed arrays for UUVs and gliders, towed arrays for submarines and surface ships, and sonobuoys
- Department of Homeland Security - Harbor and port defense
- Energy Industry - Oil and gas exploration