

Physical Laboratory

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Array Development

William S. Hodgins

Final Report to the
Office of Naval Research
Contract N00014-89-D-0142 (D0529)
For the Period 5-15-92 - 5-14-93

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Abstract

The objective of this program was to assist NRaD (formerly NOSC) in the development of a prototype slack line array in preparation for a VLF signal and noise experiment in FY94.

Research Summary

Little experimental data exists which can be applied to the design and performance evaluation of multidimensional array systems. Such data are needed both to validate signal and noise propagation models as well as to provide well-documented real data inputs to new adaptive spatial and temporal processing algorithms.

The experiment planned for FY94 will provide a multidimensional will provide a multidimensional array data set along with detailed environmental data including water column sound speed structure and geoacoustic characterization of the bottom. Slack line array (SLA) technology will be used for the vertical strings of hydrophones. NRaD has taken the lead in developing SLA technology including the hydrophone elements themselves and telemetry/digitizing for a single string, array element localization (AEL), and self-deployment (pop-up) capability for a single string.

Publications

MPL has assisted NRaD in the development of a prototype slack line array with a near-term focus on an engineering sea test late in FY93. This development has involved a number of efforts.

First, MPL has assisted NRaD in assessing the performance of slack line array hydrophones and engineering sensors as well as assessing the performance of the NRaD-designed acoustic array element localization (AEL) system. These characterizations primarily were carried out on ICESHELF'92 data and are contained in [1-2].

Second, MPL has assisted NRaD in the testing of lightweight array hardware. This has included the setting up both in-lab and at-sea real-time array data recording systems and the participation in short, local sea tests of the array hardware.

Third, MPL has participated in planning the node-to-node telemetry and telemetry between the seafloor and the ship.

Publications

- 1) W.S. Hodgkiss, "ICESHELF'92: Hydrophone and Engineering Sensor Time Series Characteristics," MPL-U-34/94, Marine Physical Laboratory, Scripps Institution of Oceanography, San Diego, CA 92152-6400 (1994).
- [2] E.D. Wolin, D.E. Ensberg, and W.S. Hodgkiss, "ICESHELF'92: Array Element Localization (AEL)," MPL-U-35/94, Marine Physical Laboratory, Scripps Institution of Oceanography, San Diego, CA 92152-6400 (1994).

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