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High resolution angular measurements with single vector sensors and arrays

Joseph Clark[a] and Dehua Huang[b]
[a]NSWCCD, Code 7340, 9500 MacArthur Blvd., West Bethesda, MD 20817-5000, USA
[b]Naval Undersea Warfare Center, 1176 Howell St., Newport, RI 02841, USA

The direction finding capability of acoustic sensors that directly measure acoustic particle velocity alone or in combination with pressure measurements (vector sensors) is well known. The angular resolution of the measurements can be improved by using arrays of vector sensors. It is also possible to improve angular resolution by additional processing of data from even a single vector sensor. This approach could be especially advantageous for sonar systems designed to operate from small platforms such as autonomous underwater vehicles. In this talk linear and non-linear methods for processing data from one or more vector sensors to achieve high angular resolution will be reviewed. Experimental investigations comparing the methods will be reported and factors found to limit the localization and detection performance of sonar systems employing the methods will be discussed.