A PERFORMANCE COMPARISON OF NEAR-FIELD SOURCE LOCALIZATION TECHNIQUES

Curt A. L. Szuberla, Kenneth M. Arnoult and John V. Olson

Wilson Infrasound Observatories
Geophysical Institute
University of Alaska Fairbanks
Fairbanks, Alaska

We present a comparison of the performance of two methods of acoustic source localization based on time difference of arrival (TDOA) information for an arbitrary array of sensors. Both methods begin with the construction of a vector containing estimates of time delays for each unique sensor pair in the array via cross correlation. We contrast a traditional method of back azimuth near-field localization via two or more sub-arrays with an optimization approach that considers the sub-arrays as part of a larger, meta-array. The optimization algorithm is shown to have superior performance characteristics in a number of situations using synthetic data. The advantages and limitations of each technique are examined.