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to Hydroacoustic Processing Utilizing Three-Dimensional Ocean Acoustic Propagation

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In support of the Comprehensive Nuclear-Test-Ban Treaty, the International Monitoring System (IMS) has implemented a set of deep water open ocean hydroacoustic stations for monitoring (detecting and localization) any nuclear tests. As acoustic propagation satisfies the acoustic wave equation sound is subject to three-dimensional effects (refraction, diffraction, reflections) when in the presence of horizontal gradients due to bathymetry, oceanography or the presence of continents. The current processing system ignores these effects (using in-plane propagation for all acoustic paths) and has large error bars in azimuth for event association. In this work, a set of acoustic propagation codes are being used to integrate 3-D propagation into the automated event localization algorithm as well as into the IMS analyst work flow. A summary of the acoustic models as well as demonstrations of observed 3-D phenomenon for large underwater events will be presented as well as a programme plan to update the IMS processing approach.

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Promotional text

Three-dimensional acoustics in hydroacoustic event processing.

Oral preference format

in-person

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