

ACOUSTICS2008/3276
Field-calibration: exploiting high-frequency mobile platform transmissions for source localization at lower frequency with arrays

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Multipath arrivals in an ocean waveguide with a reflective enough bottom can be used as a fingerprint for source range and depth and this has been demonstrated by many researchers using matched field processing. However, MFP relies upon acoustic propagation models to produce the Green's functions to be used as steering vectors for this processing. We have proposed to instead directly measure these Green's functions using wideband acoustic comms signals from mobile platforms such as AUVs that are increasingly part of naval applications. Thus we measure the multipath arrival pattern at 8-16 kHz from the many locations AUVs are visiting, and then apply such measurements for locating other sources at low frequency. A key factor in this process is being able to capture the essential features of the impulse response function at high frequency, where fluctuations are much more severe than at low frequency. We have previously presented experimental results of applying this technique using a single hydrophone receiver. Here we will report on a continuation of that work, using vertical arrays and data from the RADAR '07 experiment.