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Adaptive Removal of a Known Interference and Its Scattered Energy

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In underwater passive processing, the nearby fast moving loud surface ships produce non-stationary interference field and limit most sonar performance. After 9/11, AIS (Automatic Identify System) is required for ships larger than 60', providing ground truth of positions, speeds, and other ancillary information for the nearby surface ships. This study investigates adaptive removal of a known loud signal using the ground truth information and acoustic propagation modeling. In addition, scattered energy away from the loud signal is identified through a delay correlation processing and is also removed.

In a segment of MAPEX2k experiment conducted by SACLANT Centre off the west coast of Italy on November 28, 2000, the research vessel ALLIANCE towed an array at 2 m/s passing by a moored controlled source. The controlled source transmitted a loud 1-s 150-500 Hz LFM sequence every 15 s. In this setting, the fixed controlled source generated a non-stationary interference field received on the towed array. With the knowledge of the array tow track and source position the performance of removing the known interference and its scattered energy in a real shallow water environment is examined.