

ACOUSTICS2008/537**Ocean acoustic tomography using a double-beamforming algorithm**

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Since Munk and Wunsch proposed the basis for ocean acoustic tomography, many experiments have been performed to estimate sound speed fluctuations in the ocean, using ray identification and measurement of their travel times. However, technical limitations appeared such as the precision of the arrival time measurements or the number of ray arrivals that can be extracted from the signal.

Recently, technical improvements allowed more complete experiments using two vertical arrays of sensors (source array and hydrophone array). In this configuration, the signals between each source and receiver are recorded which greatly improve the available information to identify the acoustic rays. One way to increase the number of rays in the tomography algorithm is to perform double-beamforming on the source and receive arrays. With double-beamforming, ray arrivals are separated by emission angle, reception angle and arrival time. Thus, we solve more ray arrivals than with a single beamforming or with a point-to-point approach.

In order to avoid previous limitations and to explore acoustical limitations, we study two simple cases through the double-beamforming algorithm: with simulated data and with ultrasonic small-scale experimental data.