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Acoustic Thermometry Using Active Biological Sources Recorded at IMS Hydrophones: A Feasibility Study

The ATOC project (The ATOC Consortium, 1998) had the goal of measuring acoustic velocity in the oceans to assess variations of the ocean temperature with various applications, including long term trend monitoring of Earth climate. The method for measuring the velocity variations relied on a few active sources and receivers. Several issues hampered the project, mainly the concern over the consequences of the active sources on cetaceans. In conjunction with the work of Roda et al. (2013), we are proposing to use the calls of automatically located whales as the active source for monitoring the variation of acoustic propagation. The speed of propagation is related to an integrated measurement of temperature along the paths between the location of the whale and the IMS hydrophones. The general lines of the project are to implement automatic detection and location of the marine mammals, and jointly assess their location and speed of propagation between their location and the IMS hydrophones. The ATOC Consortium, 1998, Ocean climate change: Comparison of acoustic tomography, satellite altimetry, and modeling, Science, 281, 1327–1332. Roda, G., Sucic, V., and Le Bras R., Individual blue whale recognition. Wigner-Ville time-frequency analysis and preparation for a Kaggle contest, CTBTO S&T conference, 2013.

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