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Passive Geoacoustic Inversion using broadband ship noise in Bay of Biscay shallow water environment

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Our communication proposes a new geoacoustic inversion method for shallow water environments (100 to 300 m). The method relies on the inversion of broadband noise produced by ships of opportunity. The interference patterns generated by the ship movement and the propagation properties of the waveguide are exploited to extract the relative dispersion curves on a chosen bandwidth. These curves are then inverted to estimate geoacoustic properties.

This inversion scheme was previously tested (with success) against real data from a very shallow water (10 to 30 m) trial performed off the Southern coast of Barcelona, Spain [1].

To deal with shallow waters, our inversion scheme is improved and tests against real data from PASSTIME trial performed in Bay of Biscay during October 2005. Inversion's results are compared with ground truth and the results showed to be accurate and robust.

The proposed technique, which is suitable to a small number of hydrophones and quite easy to implement, offers interesting perspectives for passive geoacoustic inversion.

[1] S. vallez, C. Gervaise, Y. Stephan, M. Andre, Inversion géoacoustique d'un canal très petits fonds à partir des navires en mouvement - traitement incohérent, accepté pour publication Revue Traitement du Signal