

Abstract Submitted
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A three-dimensional numerical model for the noise propagation in an inhomogeneous medium. GIOVANNI PETRIS, MARTA CIANFERRA, VINCENZO ARMENIO, Univ of Trieste - Trieste — The wave equation for a viscoelastic fluid is solved to predict the acoustic response to a noise source in an inhomogeneous marine environment. The algorithm is able to handle the presence of the free-surface, stratification in the water column and interaction with a bottom layer which causes attenuation and reflection. The present model considers a monopole as a noise source. A second order central difference scheme is used for spatial and time derivatives on uniform grid. Spurious reflections at the boundaries are damped using the Perfectly Matched Layer. Validations are performed against significant benchmarks: the ideal ocean waveguide and the Pekeris waveguide. The results show that the method is able to reproduce correctly the propagation and reflection of the acoustic waves within the water column. This is true both in case of homogeneous medium and in the more interesting case of density variable medium with a bottom layer with attenuation. Advantages of the present method over the classical Helmholtz equation algorithm is the flexibility to handle complex noise sources. At the conference, the propagation of the noise generated by more complex sources, like a dipole and a quadrupole, will be presented and discussed.

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