Simultaneous reconstruction of sources and scatterers in a three-dimensional stratified ocean waveguide

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Abstract

In this work, we extend the direct method in [26] to identify the marine sources and scatterers simultaneously from the far-field pattern in a stratified ocean waveguide. The proposed approach is essentially direct and does not involve any optimizations, solution procedures or matrix inversions, thus computationally rather efficient and simple. Some numerical simulations are carried out to exhibit the robustness and effectiveness of the proposed method in the reconstruction procedure. The extended direct method can not only identify the sources in different locations but also can reconstruct the scatterers in different shapes and positions, therefore it can be considered as an efficient numerical approach for providing reliable estimates of the marine inhomogeneities in the marine acoustics.

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