Structured Session: Shallow Water Acoustics

The Inversion of the Centimeter-Scale Roughness of Seafloor Using the Broadband Reverberation Data

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The centimeter-scale roughness of water-sediment interface is difficult to measure in large area directly and quickly. We propose an inversion method based on multifrequency reverberation data. In the full-wave reverberation model, the Reverberation Averaged Intensity (RAI) is related with the roughness spectrum K(*f*) as $I(t,f) = K(f) \cdot g(t,f)$. Here g(*t*,*f*) is called the waveguide decay component which is Green function related and can be accurately estimated by using bottom reflective parameters Q(f) and P(f). Moreover, if we model K(f) as a Goff-Jordan spectrum then the included three parameters: correlated-scale, variance and spectral exponent can be reverted one by one. The inversion method is achieved through an at-sea experiment.

Keywords: broadband reverberation; bottom centimeter-scale roughness; waveguide decay component.

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