

For structured session *Shear Waves in Underwater Acoustics*  
**Sensitivity of passive bottom loss measurements to  
shear basement properties of rough, layered seafloors**

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Passive measurements of the seabed reflection coefficient offer low-environmental impact methods of surveying the layering structure of the sediment. Recently, the effects of roughness on passive seabed reflection have been studied for a layered, fluid sediment, consisting of two fluid half spaces and one fluid layer [1]. In this work, we extend the environment to include shear in the lowest half space, since the acoustic basement is typically composed of basalt, which can support shear waves. We present simulated results for total incoherent bottom loss for cases when all rough interfaces are flat, and when the water-sediment interface is rough. It is shown that, similarly to the case for fluid sediments, the presence of roughness significantly alters the interference pattern in the reflection coefficient, and thus biases the result if a flat interface model is used in an inversion. Using the incoherent model for rough surface layers, good agreement between the input shear speed and the recovered shear speed is found.

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## **References**

- [1] D.R. Olson, "The effect of seafloor roughness on passive measurements of the seabed reflection coefficient" *J. Acoust. Soc. Am.*, vol. N. P. Chotiros, "Biot model of sound propagation in water-saturated sand," *J. Acoust. Soc. Am.*, vol. 153, no. 1, pp. 586-601