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The effects of sediment variability on reflection coefficient measurements

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The statistical distribution of specularly scattered acoustic energy, commonly known as the reflection coefficient, is an important parameter when developing models for shallow water propagation and acoustic communications. The distribution of measured reflection coefficient data from 5 to 50 kHz and 10 to 70 degrees grazing angles was taken from a sea bottom recently perturbed by hurricane off the coast of Florida at the Sediment Acoustic Experiment 2004 (SAX04). The width and shape of the distributions are attributed to varying sediments in the experimental area and interface roughness. These distributions are analyzed to determine the scattering from different types of sediments including sand and mud. The effects of both roughness scattering and sediment variability on the mean value and distribution of the measured reflection coefficient will be explored. [Work sponsored by ONR Ocean Acoustics.]