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Backscattering from an elastic target near a water-sediment interface at oblique incidence: First results of tank experiments

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Sound scattering from a target situated near a water-sediment interface was studied in laboratory conditions in order to control separately all the parameters involved in the scattering process. Targets of different sizes were ensonified with wide band transducers covering the frequency range 200 kHz to 1 MHz. First, the target scattering strength was measured in the free space conditions, and the scattering strength of the water-sediment interface was measured at oblique incidence. These characteristics were used to provide a rough estimate for the signal-to-noise ratio for the second set of experiments where the target was situated near the interface to study effects of target-boundary interactions. The intensity of the total scattered field was measured as a function of the beamwidth, transducer/object and object/interface distances, frequency, grazing angle, target size and the interface roughness parameters. The interface considered here is a flattened sand surface which was studied earlier [Ivakin and Sessarego, High frequency scattering from flattened sand sediments: effects of granular structure, *J. Acoust. Soc. Am.*, 122, (5) 2007]. The targets were spherical glass beads of different size. Side scan sonar images are presented and possibilities of their qualitative interpretation are discussed.