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## Measurements of sediment backscatter in a flume: preliminary experiment results and prospective

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**Multifrequency single- and multibeam echosounders are today mature technologies for underwater mapping and monitoring of the seafloor and water column. However, the current scarcity of reference models (checked with field measurement results including detailed geoacoustical groundtruthing) for seafloor backscatter angular response and suspended sediment scattering hampers the generation of applicable information. In this context, defining heuristic models derived from measurements made in a well-controlled environment should optimize the use of backscatter data for ocean observation and management. Such reference measurements could be conducted in flumes designed for hydrodynamics and sedimentology experimental studies, since such facilities constitute well-dimensioned and equipped infrastructures adapted to the deployment of echosounders over controlled sedimentary targets. In order to check the feasibility of this concept in terms of acoustical measurement quality, a preliminary experiment was conducted in the Delta Flume (dimensions 291 x 5 x 9.5 m), as a preparation for more comprehensive systematic measurement campaigns. Multifrequency single- and multibeam echosounder data were recorded from the flume floor at various angles and from in-water fine sand plumes. The results reveal that reverberation caused by the flume walls and infrastructure does not interfere significantly with bottom targets and that fine sand plumes in the water column can be detected and measured for various particle concentrations. Future comprehensive experiments (in preparation) will feature multifrequency multi-angle measurements both on a variety of sediment types and interface roughness, and on plumes of various sediment grain size, shape and concentration.**