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Seabed sediments determination using laboratory examination of acoustic characteristics of sediments

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Abstract

Acoustic remote sensing techniques are useful tools for seabed sediment classification in hydrography. In this method, seabed sediments are estimated by sending and receiving sound waves and analysis of the backscatter data. Backscatter data from sediment have several features that by extracting them, sediment separating and classification can be done. In this study laboratory conditions are prepared to investigate the acoustic properties of sediments. Echo receive from sediment in 4 frequencys (55, 60, 65, 73 kHz) were processed using acoustic devices for 4 types of sediments placed in the aquarium bed. Features were extracted, including statistical moments (energy, time-spread, skewness and kurtosis), spectral moments (standard deviation, the order of the moments, spectral skewness, spectral kurtosis and power spectral density) and the fractal dimensions (Hausdorff). In this experiment, energy parameter, standard deviation and average power (from power spectral density) well able to distinguish sediments.

Keywords: Acoustic remote sensing, Acoustic wave, Seabed sediments, Hydrography.

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