

GeoAcoustic Soil Classification

Offshore acoustic high-frequency backscatter strength is typically used as a proxy of soil classification. Their correct interpretation can lead to important cost reduction in exploration, further sampling strategies and the study of seafloor natural phenomena. There is urgent need to obtain geotechnical properties from high-frequency acoustic surveys. Its low-cost respect to other exploration approaches, and the improvements in computational methods and equipment, makes it very attractive for offshore site examination. Advances in recent years were able to analytically derive and validate in laboratory the correlation between the coefficient of reflectivity and sediment's void ratio at low effective stress. However, this geotechnical approach has not been tested in natural environments yet. This thesis objective is to validate and expand this new approach using artificial and natural sediments at the lab and field scale to better understand the interaction of acoustic wave backscatter strength and soil structure at low stress at various frequencies, grain size and depositional environments.

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