

LIRmeter

a new tool for rapid assessment of sea-floor strength

Technical Specifications

Electrical

Power Supply	Lithium Polymer (20 Ah)
Acceleration Sensors	Ranges from 1.7 g to 6 g
Data Acquisition (DAQ)	16 bits, 16 channels, 250000 samples per second
Communications	Control of DAQ via web- interface or via SSH/SFTP

Mechanical

Length (rod)	4.85 m (4.00 m)
Weight	280 - 750 kg
Expandability of weight - stand	two more pressure-cases
Variability	weight variable / 45 & 60 cm ² tips

Handling

Operating depth (m)	up to 4500 m
Operation progress (water depth = 30 m)	1 pen @ 2 minutes

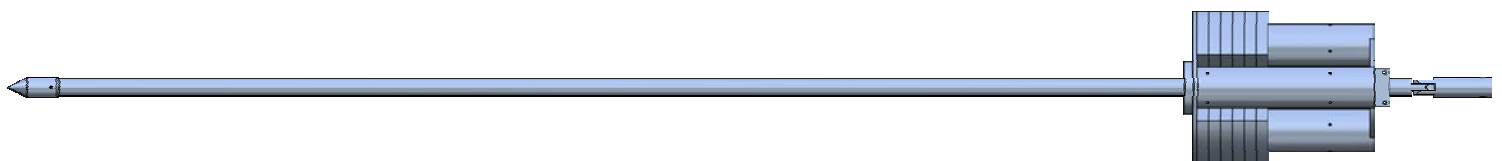
Description

LIR is an acronym for Lance Insertion Retardation Meter. The LIRmeter is a new tool for rapid *in-situ* assessment of sea-floor strength. The tool can survey the upper four meters of marine sediments. This is done by registration of the occurring acceleration during the penetration process. In general, high deceleration indicates a mechanically soft sediment, whereas low decelerations indicate a mechanically hard sediment. Geotechnical parameters like shear-strength or bearing capacity can be deduced from acceleration measurements by applying state-of-the-art methods for post-processing.

This measurement-system for a dynamic penetrometer has been developed within the framework of a cooperative-project. Project-partner is FIELAX GmbH (www.fielax.com) in Bremerhaven. The measurement-system could prove its functionality and reliability on three research cruises under different sediment-, depth-, and weather-conditions (SO 207 off Costa Rica, Planet in Dec. 2010, HE-347 in the German Bight).

The LIRmeter can penetrate marine sediments in a pogo-style, which allows a rapid propagation during a measurement-campaign. This new method is planned to bridge the gap between shallow-penetrating free-fall instruments and conventional CPT-measurements. The advantage is greater penetration depth than free-fall instruments and lesser footprints than those caused by conventional marine CPTs.

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