

## PRE-CONFERENCE SHORT COURSE & LAB WORKSHOP: NOVEL MEASUREMENT TECHNIQUES IN COASTAL MODELLING

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**KEYWORDS:** Physical Modelling, Instrumentation, Laser Scanning, IMU Sensors, Digital Cameras, Breakwaters.

### ABSTRACT

In the lecture several recent developments in laboratory measurement techniques are discussed. Techniques like digital cameras, laser scanners, and IMU sensors are improving in quality and become more accessible every year. They are also increasingly used in hydraulic modelling. Examples are given of the use of these techniques in quantifying the response of (Figure 1) and load on (Figure 2) coastal structures. The novel techniques enable us to see new processes, of quantify known processes in a novel manner. It is shown that measurements should be tailored to the specific processes and failure mechanisms that are studied. The large spatial coverage enables improved characterization of processes, and better quantification of the measurement uncertainty.

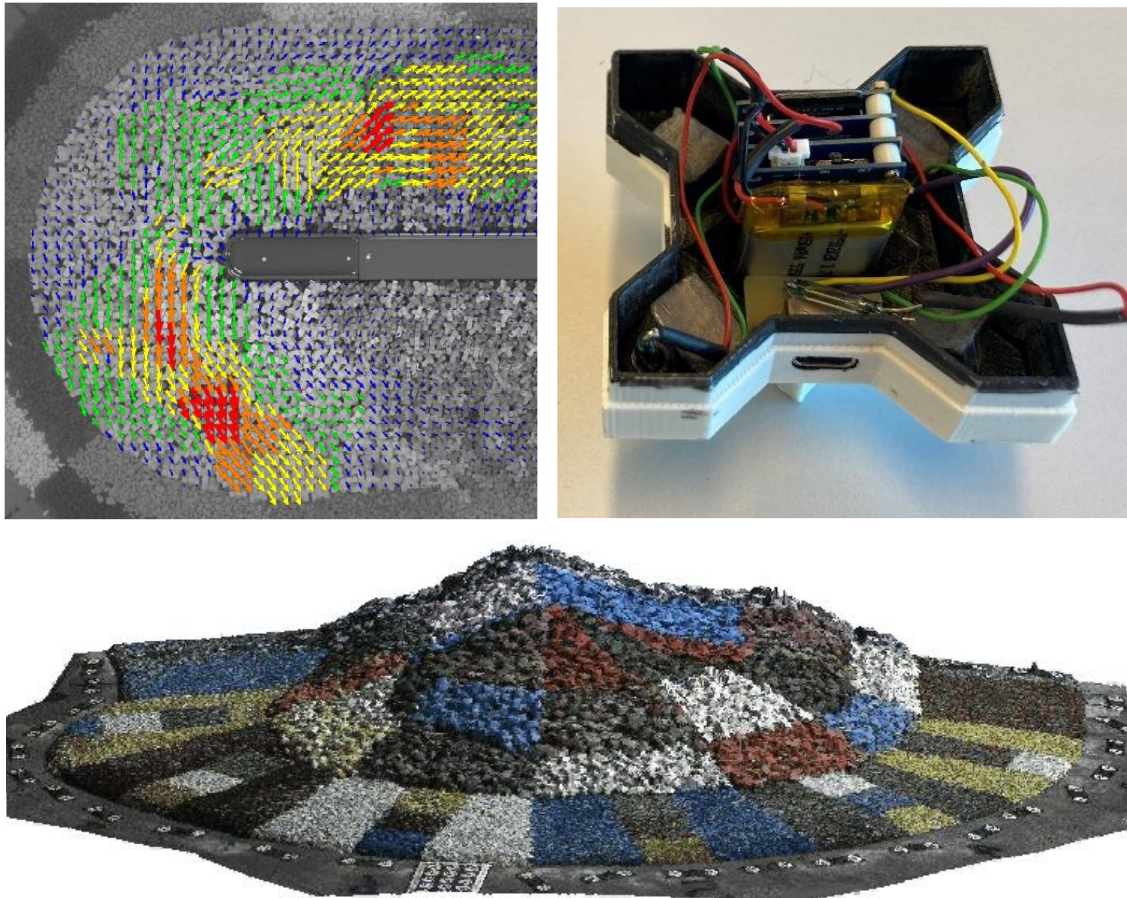
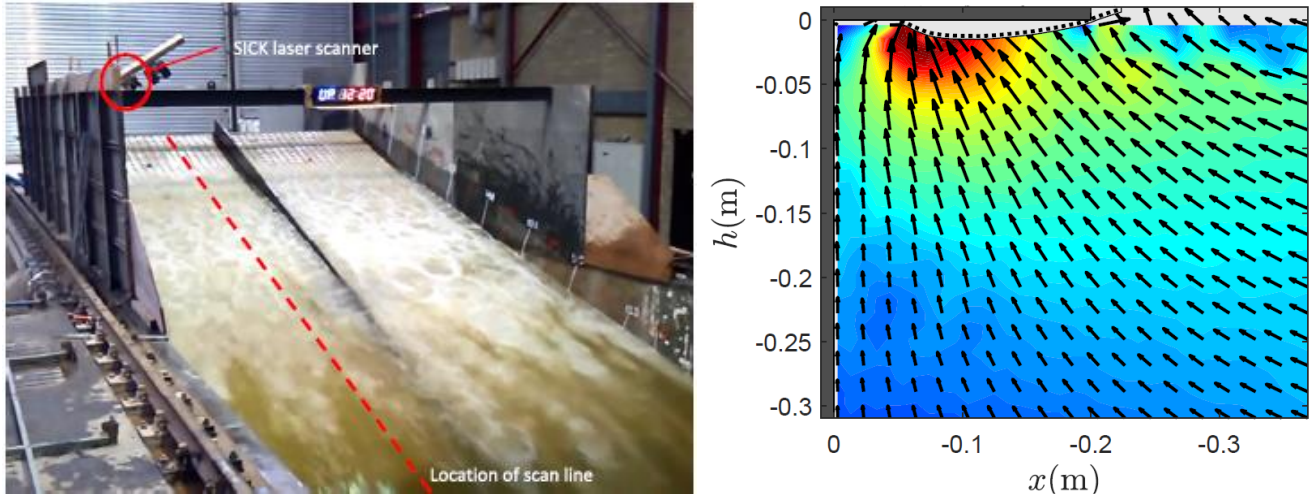


Figure 1. Settlement analysis of units on roundhead (Hofland & Van Gent 2016). IMU sensor in model breakwater armour unit (Hofland et al. 2023), and laser scan of breakwater roundhead (Hofland et al 2014).



**Figure 2. Laser scanning of wave runup and overtopping in Delta Flume (Hofland et al. 2015) and velocity field just before a confined wave impact (Bakker et al. 2021).**

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