Performance of a Tilt Current Meter in the Surf Zone

Tilt Current Meters (TCM’s) are relatively simple and inexpensive instruments for measuring currents in rivers and in the sea. Their low cost and easy deployment mean that a relatively large number of TCM’s can be deployed compared to more conventional current meters such as Acoustic Doppler Velocimeters (ADV’s) or Acoustic Doppler Current Profiler (ADCP’s). Although, the accuracy of the individual measurements may not be as good as conventional current meters, the possibility of deploying many instruments is a great advantage when studying spatial variations in flows. This is especially the case when data is later used for comparison with numerical models whose results are also associated with considerable uncertainty. Previous studies have mainly considered steady current or tidal flows in which velocities were relatively low and the importance of waves limited. The presence of waves adds a number of important challenges to the measurements as the hydrodynamic forcing changes and the oscillations of the TCM cannot necessarily be averaged out as for a steady current. This study addresses some of these challenges by analyzing the performance of a TCM in the surf zone where wave orbital motion is dominant.

General information
Publication status: Published
Organisations: Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, University of Copenhagen
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Number of pages: 11
Publication date: 2017
Peer-reviewed: Yes
Keywords: Coastal hydrodynamics, Surf zone, Observational techniques
Electronic versions: 218_Hansen_etal.pdf
Research output: Contribution to conference › Paper – Annual report year: 2017 › Research › peer-review