

Abstract Submitted
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Detection of breaking waves in single wave gauge records of surface elevation fluctuations¹ DAN LIBERZON, ALEXANDRU VREME, SAGI KNOBLER, Technion - Israel Institute of Technology — We report the development of a new method for accurate detection of breaking water waves, which addresses the need for an accurate and cost-effective method that is independent of human decisions. The new detection method, which enables the detection of breakers using only surface elevation fluctuation measurements from a single wave gauge, supports the development of a new methodology for research relating to water waves and wind-wave interactions. According to the proposed method, detection is based on the use of the Phase-Time Method (PTM) to identify breaking-associated patterns in the instantaneous frequency variations of surface elevation fluctuations. A wavelet-based pattern recognition algorithm is devised to detect such patterns and provide accurate detection of breakers in the examined records. Validation and performance tests, conducted using both laboratory and open sea data, including mechanically generated and wind-forced waves, are reported as well. These tests allowed derivation of a set of parameters assuring high detection accuracy rates. The method is shown to be capable to achieve a positive detection rate exceeding 90 percent.

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