On microseisms recorded near the Ligurian coast (Italy) and their relationship with sea wave height

In this study, microseism recordings from a near coast seismic station and concurrent significant sea wave heights (H13) are analysed to calibrate an empirical relation for predicting sea wave height in the Ligurian Sea. The study stems from the investigation of the damaging sea storms occurred in the Ligurian Sea between 2008 October and November. Analysing data collected in this time frame allows identification of two types of microseism signal, one associated to the local sea wave motion and one attributable to a remote source area. The former is dominated by frequencies greater than 0.2 Hz and the latter by frequencies between 0.07 and 0.14 Hz. Moreover, comparison of microseism spectrogram and significant sea wave heights reveals a strong correlation in that the spectral energy content of microseism results proportional to the sea wave height observed in the same time window. Hence, an extended data set including also observations from January to December 2011 is used to calibrate an empirical predictive relation for sea wave height whose functional form is a modified version of the classical definition of H13. By means of a Markov chain Monte Carlo algorithm we set up a procedure to investigate the inverse problem and to find a set of parameter values for predicting sea wave heights from microseism.

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