



Meteotsunami occurrence frequency along the Mediterranean coasts

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A number of research studies describe exceptional destructive meteotsunami events since long time whereas no systematic database is available of moderate events because sea level data were recorded with insufficient resolution. Sea level measurements recently collected with high sampling rate, one per minute or less, by tide gauges positioned along the Mediterranean coasts are examined, aiming to analyze the occurrence of oscillation events in the tsunami frequency range. Sea level data from operating tide stations inside the Mediterranean basin are made publicly available through the Intergovernmental Oceanographic Commission Sea Level Monitoring Facility web site (<http://www.ioc-sealevelmonitoring.org/>). After the implementation of a rigorous quality check procedure to the raw water level time series, Hilbert transform is applied to two hour high-pass filtered observations to identify tsunami-like oscillation events. Events of seismic origin are identified by consistency between earthquake occurrence and tsunami wave travel time from the earthquake epicenter to the specific tide gauge. Similar analyses are performed to exclude sea waves induced harbor seiches events. A list of probable meteotsunami episodes occurred in the Mediterranean region is so compiled and their occurrence frequency and intensity statistics are evaluated at the different tide gauge sites over the time period of high frequency water level data availability ranging from five to seven years. The effects of atmospheric conditions and seabed topography are discussed. Detection and characterization of meteotsunamis, both of exceptional character and of weak intensity, represent an essential step toward improved assessments of coastal flooding risk along the Mediterranean coasts.