{rokbox title=|Map with the locations of the tide gauges used in this study :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-meteotsunamis-western-mediterranean-jorda-2026-thumb-et-al.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-meteotsunamis-western-mediterranean-jorda-2026-et-al.jpg{/rokbox}

Joan Villalonga, Josep Pascual, Joan Puigdefàbregas, Damià Gomis, and **Gabriel Jordà**, 2026.
Meteotsunamis in the Western mediterranean: a regional analysis from high-frequency sea level observations
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Abstract: Ciutadella harbor, in Menorca (Balearic Islands), is a well-known hotspot for the occurrence of meteotsunamis, i.e., tsunami-like sea level oscillations generated by atmospheric disturbances. This phenomenon represents a significant hazard for Ciutadella and other coastal locations of the Balearic Islands and the NE Iberian Peninsula, as meteotsunamis can cause flooding events and damage to harbor infrastructures. Nevertheless, scientific studies on meteotsunamis at places other than Ciutadella are scarce. In fact, this work is the first regional characterization of the phenomenon. It has been possible thanks to the availability of high-resolution (1-minute) tide gauge data from 27 stations. The analysis of the sea level records reveals that the impact of meteotsunamis is spatially heterogeneous, with large events occurring only in locations with a large resonant amplification. We have found that, aside from Ciutadella, other locations (Vilanova, Portocolom and Port de Sóller) suffer from frequent, large events. Additionally, large sea level oscillations occur simultaneously at different sites, as they are linked to synoptic-scale atmospheric patterns that can cover a significant fraction of the region. This also explains the shared meteotsunami seasonality, with most events occurring in late spring and summer. In some locations, however, the number of out-of-season events is not negligible; these events are shown to be linked to atmospheric phenomena other than those generating the typical summer meteotsunamis. Finally, the inference of amplitude relationships across sites has not been possible, because the amplitude of the oscillations is determined by local coastal topography and by small-scale features of the atmospheric disturbances.

Keywords: Atmospheric Dynamics, Coastal Sciences, Disaster, Flooding, Microsatellite instability, Natural Hazards, Tsunami Hazard Assessment and Mitigation Strategies.