



The 1887 tsunami in the Ligurian Sea: detailed appraisal of tsunami waves in the Genoa harbour (Italy) through observations and numerical modeling

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The February 1887 earthquake in the Ligurian Sea triggered a significant tsunami observed along several coastlines of the Ligurian Sea in Italy and France. The maximum run-up historically reported amount to 1 to 2 m, essentially in harbours and beaches which were quite unpopulated at that time, in addition in winter and early in the morning. The original magnitude of the earthquake was estimated from 6.2 to 6.5, with a probable shallow thrusting mechanism, with a fault geometry however still debated.

A tide gauge record is available for this tsunami event in the Genoa harbour (Italy). While the literature reported a 20-cm maximum observed tsunami amplitude (Eva and Rabinovich, 1997), a comparison of the mareogram with tide predictions calculated from the harbour tidal harmonic constants has revealed that the tidal range on mareogram reproduction was increased by an approximate scale factor 3 (outcome of the French research project Maremoti, 2012). Thus after correction of the digitized sea level signal, the tsunami amplitude in this specific harbour is reduced and does not exceed 7 cm.

With the help of a contemporary nautical chart accounting for the harbour characteristics and bathymetry at the time of the earthquake, and using tsunami numerical modeling, we discuss various earthquake models able to fit this reduced amplitude. This study allows to define the most plausible earthquake mechanisms at the origin of the tsunami waves observed in 1887. In addition, we discuss the results in terms of uncertainties influencing the tsunami hazard assessment.

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