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# The 1887 earthquake and tsunami in the Ligurian Sea: analysis of coastal effects studied by numerical modeling and prototype for real-time computing

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The February 1887 earthquake in Italy (Imperia) triggered a tsunami well observed on the French and Italian coastlines. Tsunami waves were recorded on a tide gauge in the Genoa harbour with a small, recently reappraised maximum amplitude of about 10-12 cm (crest-to-trough). The magnitude of the earthquake is still debated in the recent literature, and discussed according to available macroseismic, tectonic and tsunami data. While the tsunami waveform observed in the Genoa harbour may be well explained with a magnitude smaller than 6.5 (Hébert et al., EGU 2015), we investigate in this study whether such source models are consistent with the tsunami effects reported elsewhere along the coastline.
The idea is to take the opportunity of the fine bathymetric data recently synthetized for the French Tsunami Warning Center (CENALT) to test the 1887 source parameters using refined, nested grid tsunami numerical modeling down to the harbour scale. Several source parameters are investigated to provide a series of models accounting for various magnitudes and mechanisms. This allows us to compute the tsunami effects for several coastal sites in France (Nice, Villefranche, Antibes, Mandelieu, Cannes) and to compare with observations.
Meanwhile we also check the computing time of the chosen scenarios to study whether running nested grids simulation in real time can be suitable in operational context in term of computational cost for these Ligurian scenarios.
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