

## **Numerical investigation of the 6 February 1783 landslide-induced tsunami in Scilla (Italy)**

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The seismic crisis that struck Calabria (Southern Italy) in the period 1783-1785 is one of the most studied and documented in the Italian seismic catalogues, both for its exceptional length and for its death and damage toll. In the first two months, from February to March 1783, as many as 5 massive tsunamigenic earthquakes took place in the region. Tsunami effects resulted to be usually minor if compared to consequences of the earthquakes, with one exception. After the shock of February 6th, a large subaerial portion of Mount Pacì collapsed into the sea, provoking a local tsunami that attacked the village of Scilla, less than 1 km far. Unfortunately, almost all of the town population had gathered in the shore to escape far from buildings crashes caused by frequent earthquake shocks. The result was that about 1500 persons died, caught by up to 9 m waves flooding the low beach of Marina Grande. The waves affected also the surrounding coasts of Calabria, and the coasts of Sicily on the opposite side of the Messina Straits.

Some marine surveys, performed in 2005 and 2006, characterized the morphology of the offshore area, supporting the existence of an underwater depression, continuing the already evident subaerial scar, and describing a submarine mass deposit, made of huge blocks, at about 300 m b.s.l., that can be associated with the sliding event.

The exact amount of the involved volume is still a matter of investigation and it ranges from 6 million m<sup>3</sup> (considering only the subaerial scar) to 9 million m<sup>3</sup> (by further adding the contribution from filling the submarine depression).

The two possible (minimum and maximum) scenarios are here investigated by means of numerical simulation codes, UBO-BLOCK and UBO-TSUF, modelling the landslide and the generated tsunami respectively. The scenarios are compared and evaluated against the large amount of available and valuable historical observations that are particularly abundant and detailed for the Marina Grande area.

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