Investigation on potential landslide sources along the Hyblaean-Malta escarpment for the 1693 tsunami in Eastern Sicily (Southern Italy)

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The study of the source of 1693 tsunami in eastern Sicily (South Italy) is still debated in the scientific community. Macroseismic analyses provide inland location for the epicenter of the earthquake, while historical reports describing 1-2 m waves hitting the coast suggest the existence of at least an offshore extension of the fault. Furthermore, an anomalous water elevation was described in Augusta (between Siracusa and Catania), that was interpreted as the manifestation of a local submarine landslide.

The presence of the steep Hyblaean-Malta escarpment, that runs parallel to the eastern coast of Sicily at a short distance from the shoreline and is cut by several canyons and scars, corroborates the hypothesis of a landslide occurrence, though no clear evidence has been found yet.

This research, realized in the frame of the project ASTARTE (Assessment, Strategy And Risk Reduction for Tsunamis in Europe - FP7-ENV2013 6.4-3, Grant 603839), aims at assessing the effect of landslide-generated tsunamis on the coastal stretch around Augusta considering different scenarios of collapsing masses along the Hyblaean-Malta escarpment. The slide dynamics is computed by means of the numerical code UBO-BLOCK1 (developed by the University of Bologna Tsunami Research Team), and the corresponding tsunami is simulated via the code UBO-TSUFD.

The sliding bodies are placed in different positions in order to assess which of them could produce significant effects on the town of Augusta, providing then clues on the possible source area for the hypothesized slide related to the 1693 tsunami. The sensitivity analysis shows the spatial dependence of the coastal tsunami height on the source volume, position, distance from the coast, and on other parameters.