Geophysical Research Abstracts
Vol. 12, EGU2010-7000-1, 2010
EGU General Assembly 2010

Tsunami inundation scenarios of the city of Catania, Eastern Sicily, Italy.

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Eastern Sicily is one of the coastal areas most exposed to earthquake and tsunami in Italy and in the whole Mediterranean. The city of Catania lies on this coast, between the eastern base of Etna volcano and the Ionian Sea. Catania is an important town of the Southern Italy because of its both touristic and commercial activities.
In this work some reliable tsunami scenarios for the city of Catania are proposed on the basis of tectonic considerations and of the historical events that hit the city in the past. The most famous are the tsunamis associated with the 11 January 1693 and the 28 December 1908 earthquakes, of which the source determination is still an open issue, because it is not clear if the tsunamis were generated by the earthquake only or by a landslide or by a combination of both. One remote source based on the 365 A.D. West Hellenic Arc event is also considered in order to complete the possible tsunami scenarios for the town of Catania. The work is focused on the area of the harbour where many human activities and structures are present. Nowadays the harbour is protected by a long jetty opened in the south and here the coast presents two very different morphological aspects: moving southern respect to the harbour the coast is sandy and shallow, while moving northern it is rocky and high. Inundation maps computed on a 40-meters resolution grid are shown in order to identify the areas most exposed to tsunami inundation in this specific area and to study the harbour response to tsunami wave trains of different frequencies.
All simulations are carried out by means of the numerical finite difference code UBO-TSUFD, which solves both linear and non-linear shallow water equations on multi-grid domain that allow to increase the grid resolution in the area of interest. The code can compute the inundation of specific areas and it is developed and maintained by the research team itself.
The work has been developed in the framework of the EU-funded project SCHEMA, where Catania has been chosen as one of the test sites on which carrying out a tsunami vulnerability assessment study.