Geophysical Research Abstracts
Vol. 13, EGU2011-4610, 2011
EGU General Assembly 2011

Tsunami vulnerability assessment for harbours of the Adriatic coast of Apulia, Italy, performed through the worst-case tsunami scenarios approach

Gianluca Pagnoni (1), Stefano Tinti (1), Alberto Armigliato (1), Roberto Tonini (1,2), and Filippo Zaniboni (1)

(1) University of Bologna, Dept. of Physics, Sector of Geophysics, Bologna, Italy (gianluca.pagnoni3@unibo.it), (2) INGV, Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Bologna, Italy

Apulia is a region of southern Italy with about 800 km of coasts watered by the Adriatic and the Ionian seas, with great part of its economy (tourism and trades) developing in the coastal belt. This region is known to have been affected by some large tsunamis in the past. This study utilises the approach of the worst-case tsunami scenario to evaluate the tsunami vulnerability of some of the most important harbours, and their surroundings, that are located in the Adriatic coast of the region, south of the Gargano promontory. In addition to the local sources such as the seismogenic zone responsible for the great 1627 tsunami hitting the northern coast of Gargano promontory, remote sources will be investigated, such as the ones on the eastern coast of the Adriatic and in the western Hellenic arc. Here it suffices to mention that along the coast of Croatia and Montenegro strong earthquakes have generated tsunamis (see the April, 6 1667 event caused by a M=7.2 shock), and that the largest tsunami affecting the central-eastern Mediterranean is probably the one produced in 365 A.D. by a M=8.3 earthquake located in the western Hellenic arc. This latter tsunami is known to have penetrated in the southern Adriatic sea, and probably affect the Apulia coasts.

In addition to earthquake sources, tsunami scenarios should include also submarine slides. Indeed, recent bathymetric surveys have found evidence that the west margin of the Adriatic platform is prone to slope instability in several areas. The major identified slide is called “Gondola” slide: it took place presumably about 25 Kyrs BP and involved about 4.5 km3 of material.

Tsunami scenarios are calculated using the tsunami propagation code UBO-TSUFD (developed and maintained by the Tsunami Research Team of the University of Bologna), solving the equations of Navier–Stokes in shallow water conditions and allows for domain nesting to account for different space resolution. The results of numerical simulations, in particular the extension of the flooded area, the flow depth, the computed tsunami currents, will be used to evaluate the vulnerability of harbours of the Adriatic coast of Apulia, such as Bari and Otranto. One of the main objectives of this work is to assess if and to which extent jetties and breakwaters that protect harbour waters from the usual storm waves are also effective in protecting the harbours against the attack of the tsunamis of the worst-case scenarios.