Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05369, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05369
EGU General Assembly 2008


# An hybrid statistical-deterministic approach to tsunami hazard estimation along the coasts of the Adriatic Sea

S. Tinti (1), **A. Armigliato** (1), R. Tonini (1), A. Maramai (2) and L. Graziani (2)

(1) Università di Bologna, Dipartimento di Fisica, Settore di Geofisica, Bologna, Italy, (2) Istituto Nazionale di Geofisica e Vulcanologia (INGV), Sezione Roma 2, Unità Funzionale "Ricerche Interdisciplinari Geo-marine", Rome, Italy

In the European area, and in particular in the Mediterranean basin, the Adriatic Sea is probably not one of the most exposed regions to tsunami hazard and risk. Nonetheless, tsunami catalogues clearly indicate that the historical tsunami activity in the Adriatic basin is not negligible. The major known events had tectonic origin and their geographic distribution roughly resembles that of the seismicity. Along the Italian Adriatic coasts, the two regions that experienced the largest historical tsunamis are Romagna-Marche and the Gargano promontory. The most famous event took place here and occurred on 30 July 1627. It was an earthquake-generated tsunami, with reported tsunami intensity equal to 5 (Sieberg-Ambraseys scale) in the most recent Italian Tsunami Catalogue (ITC04, Tinti et al., 2004). Southern Apulia is also exposed to tsunami hazard, as testified by the event of 20 February 1743. On the eastern side of the basin, the coastal regions with the highest tsunami exposure are the Dalmatian and the Albanian ones. In addition to local sources, also far-field sources, especially those located in correspondence with the Greek Ionian islands and the western Hellenic Trench, might contribute to increase the tsunami hazard in the Adriatic Sea, especially in its southern sector.

Hence, assessing tsunami hazard along the Adriatic Sea coasts is a relevant topic, taking also into account that, especially in the peak season, these coasts form one of the most densely populated areas in the Mediterranean. In the framework of the EU-funded project TRANSFER (Tsunami Risk and Strategies For the European Region), coordinated by the Department of Physics of the University of Bologna, Italy, we

face the problem of assessing quantitatively the tsunami hazard in the Adriatic Sea by means of a hybrid statistical-deterministic approach, already applied in the recent past to the southern Tyrrhenian and Ionian coasts of Italy. The general idea is to base the tsunami hazard analyses on the computation of the probability of occurrence of tsunamigenic earthquakes, which is appropriate in basins, like the Adriatic Sea, where the number of known historical tsunamis is too scarce to be used in reliable statistical analyses, and the largest part of the tsunamis had tectonic origin.

The approach can be roughly summarised in the following steps: 1) determination of the earthquake occurrence rate by means of proper statistical analysis of a given earthquake catalogue; 2) use of suitable relationships between earthquake magnitude and the initial disturbance of the sea; 3) estimation of the number of tsunamigenic earthquakes expected to produce on the coasts wave heights larger than a given threshold, by means of known simplified amplification formulas taking into account the tsunami features at the source and the sea bottom topography. The information on the number of events can be easily translated into exceedance probability estimates if we adopt a suitable probability distribution function (e.g., Poissonian). We compare the results with the information deducible from ITC04 and different European Tsunami Catalogues and discuss how the different assumptions/methods/data involved in the analysis influence the final results.