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Tsunami hazard in southern Italy from far-field tectonic sources: numerical scenarios

S. Tinti, A. Armigliato, S. Gallazzi, G. Pagnoni, R. Tonini and F. Zaniboni
Università di Bologna, Dipartimento di Fisica, Settore di Geofisica, Bologna, Italy

We present a preliminary attempt to quantify the tsunami hazard along the coasts of southern Italy, determined by distant active seismic structures. In particular, we concentrate on the Ionian and southern Adriatic coasts of Italy. Tsunami catalogues clearly indicate that these coastlines are not only exposed to the tsunami hazard related to local sources (earthquakes, mass movements and volcanic activity), but also to far-field sources. Although the role of far-field coastal/submarine mass movements (landslides, slumps, volcanic collapses) cannot be neglected, we concentrate in particular on the far-field tectonic sources, since they are known to be able to produce tsunamis whose energy decays slowly upon propagation, and are then expected to produce relevant tsunami effects even at large distances form the source. The technique we adopt is that of numerical scenarios. Based on the records contained in the available earthquake and tsunami catalogues as well as on basic seismotectonic information, we identify different seismogenic areas in southern Croatia, Albania and the western Hellenic Arc. For each of them, we take into account a fault or system of faults capable of generating an earthquake with magnitude equal or larger than the highest magnitude registered in that region in historical times, and then simulate numerically the ensuing tsunami. From the modelling point of view, the tsunami initial condition is taken to coincide with the vertical coseismic displacement induced by a given fault, and the tsunami propagation is simulated by means of a shallow-water finite-element code. In all cases, we highlight the basic features of the wave propagation, in particular the tsunami travel times and the directions of energy focusing/defocusing. Moreover, we attempt to identify the coastal sectors of eastern Sicily, Ionian Calabria, Basilicata and Apulia that are expected to suffer the heaviest tsunami effects, and to quantify the highest expected tsunami heights. The obtained results may provide useful hints both for civil protection purposes and for the design of the future Mediterranean tsunami

early warning system.