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Preliminary Seismic Probabilistic Tsunami Hazard Map for Italy

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We present a preliminary release of the first seismic probabilistic tsunami hazard map for Italy. The map aims to become an important tool for the Italian Department of Civil Protection (DPC), as well as a support tool for the NEAMTWS Tsunami Service Provider, the Centro Allerta Tsunami (CAT) at INGV, Rome. The map shows the offshore maximum tsunami elevation expected for several average return periods. Both crustal and subduction earthquakes are considered. The probability for each scenario (location, depth, mechanism, source size, magnitude and temporal rate) is defined on a uniform grid covering the entire Mediterranean for crustal earthquakes and on the plate interface for subduction earthquakes. Activity rates are assigned from seismic catalogues and basing on a tectonic regionalization of the Mediterranean area. The methodology explores the associated aleatory uncertainty through the innovative application of an Event Tree. Main sources of epistemic uncertainty are also addressed although in preliminary way. The whole procedure relies on a database of pre-calculated Gaussian-shaped Green's functions for the sea level elevation, to be used also as a real time hazard assessment tool by CAT. Tsunami simulations are performed using the non-linear shallow water multi-GPU code HySEA, over a 30 arcsec bathymetry (from the SRTM30+ dataset) and the maximum elevations are stored at the 50-meter isobath and then extrapolated through the Green's law at 1 meter depth.
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