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Tsunami Numerical Modelling in the Eastern Ionian Sea

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This study is an attempt to identify several tsunamigenic sources located offshore in the vicinity of Peloponnese Peninsula, Kefalonia and Lefkada. Ionian Sea is surrounded by major geological structures, like the Hellenic and the Calabrian subduction zones and in addition its lithosphere is submerging beneath Eurasian tectonic plate. These tectonic features are the main cause for devastating earthquakes and tsunami waves. In the seismic history of the Ionian Sea there are several strong earthquakes that generated tsunami waves in the southern Peloponnese 1867 (Ms7.1), Ithaca Island 1915 (Ms6.7), north of Kefalonia 1948 (Mw6.5) and Lefkada 2015 (Mw6.5). Considering several seismic sources located in the eastern Ionian Sea in agreement with the European Database of Seismogenic Faults we present results of numerical simulations of the tsunami generation and propagation using the model UBO-TSUFD (Tinti and Tonini, 2013). The code is based on the nonlinear shallow-water equations of Navier-Stock. Okada's method (1985) is used to compute the initial tsunami elevations. Known focal mechanisms associated with recent earthquakes are selected for the hypothetical tsunamigenic scenarios. Tsunami simulations results are shown as maximum water elevations and propagation fields. The contribution of all scenarios along the Peloponnese, Kefalonia and Lefkada is studied via synthetic mareograms. The water column on the coastline is computed and presented as simplified colored map.

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