Examples of tsunami synthesis: Excitation by offshore and coastal seismic sources

Fabio Romanelli, Tatiana B. Yanovskaya, and Giuliano F. Panza

Department of Earth Sciences, University of Trieste, Trieste, Italy[1]

Abstract. We study how the tsunami mode is generated by a offshore seismic source and how it propagates in realistic models of oceanic media. The method is the direct extension to tsunami waves, propagating in multilayered oceanic media, of the well-known Haskell method, which has been successfully employed for the study of Rayleigh and Love waves in multilayered structures and for the construction of broadband synthetic seismograms. This method is then extended to laterally heterogeneous structures in order to study the effect of the variation of the ocean bottom. A new approach based on the Green function technique is proposed for the modeling of the excitation of tsunami by sources near to the coast, both inland and at the sea. Synthetic mareograms have been calculated for different locations of the source, for different source mechanisms and depths; possible applications to the tsunami hazard estimation in the Mediterranean sea are shown.

[1]University of Trieste, Department of Earth Sciences, Via Weiss 4, 34127 Trieste, Italy (romanel@dst.univ.trieste.it)