Numerical modelling of tsunami waves: Application to the simulation of specific earthquake generated tsunamis

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Tsunami waves (long waves) are effectively modelled by the nonlinear shallow water equations. These are often solved numerically by appropriate finite difference or finite volume techniques. For the applications presented herein, a splitting direction based, finite difference method is applied for the construction of an approximate solution. All three phases of the evolution of the tsunami wave, the generation, propagation and runup are reproduced, providing a complete simulation capability of the tsunami wave.

Historical descriptions of earthquakes in the sea, as well as geological/ seismological literature references, are used for the construction of appropriate initial conditions for the simulation of the tsunamis that followed. Detailed bathymetric and topographic data are used for accurate representation of the coastal areas under consideration. Inundation maps, focusing on selected coastal areas, are shown.