Geophysical Research Abstracts
Vol. 20, EGU2018-5332, 2018
EGU General Assembly 2018

Modeling the 1+1D runup with time parameters of the earthquake source

Mauricio Fuentes (1), Sebastián Riquelme (2), Javier Ruiz (1), and Jaime Campos (1)

(1) Department of Geophysics, University of Chile, Chile (mauricio@dgf.uchile.cl), (2) National Seismological Center, University of Chile, Chile (sebastian@dgf.uchile.cl)

The time characteristics of the seismic source are usually neglected in tsunami modeling, due to the difference in the time scale of both processes. Nonetheless, there are just a few analytical studies that intended to explain separately the role of the rise time and the rupture velocity. In this work, we extend an analytical 1+1D solution for the shoreline motion time series, from the static case to the kinematic case, by including both, rise time and rupture velocity. Results show that the static case correspond to a limit case of null rise time and infinite rupture velocity. Both parameters contribute in shifting the arrival time, but maximum run-up may be affected by very slow ruptures and long rise time. Parametric analysis reveals that runup is strictly decreasing with the rise time while is highly amplified in certain range of slow rupture velocities. For even lower rupture velocities, the tsunami excitation vanishes and, for larger, quickly approaches to the instantaneous case.