Geophysical Research Abstracts
Vol. 20, EGU2018-1261-1, 2018
EGU General Assembly 2018

Predicted ground motions for interface earthquakes in the southern Aegean Sea: Implications for large thrust earthquakes of the Hellenic subduction

Harris Kkallas (1), Costas Papazachos (2), and Vasilis Margaris (3)

(1) School of Geology, Aristotle University of Thessaloniki, Thessaloniki, Greece (chkkalla@geo.auth.gr), (2) School of Geology, Aristotle University of Thessaloniki, Thessaloniki, Greece (kpapaza@geo.auth.gr), (3) Institute of Engineering Seismology & Earthquake Engineering (EPPO-ITSAK), Thessaloniki, Greece (margaris@itsak.gr)

We investigated the source, path and site characterizations of shallow earthquakes of the south Aegean subduction zone (interface events with thrust faulting). To calibrate them we employed the method used by Motazedian and Atkinson (2005), as described by Boore (2009). The employed dataset was compiled using all the available data recorded by the CYCNET and EGELADOS seismic monitoring projects (Bohnhoff et al., 2004; Friederich and Meier, 2008), GEOFON (Hanka and Kind, 1994) and HUSN (Hellenic Unified Seismic Network) from shallow events with magnitude larger than ∼M5 that occurred in the south Aegean subduction zone. To study the effects of the main modelling of the EXSIM simulation approach, a large number of shallow earthquake simulations was performed, incorporating site effects, source and the path characterizations. For the seismic source geometry, necessary for the finite fault modelling, the estimation of fault dimensions from moment magnitude for dip-slip faults in subduction regions is adopted (Papazachos et al. 2004, Papazachos et al. 2006). For all simulations, we optimized the stress drop parameter with a trial-and-error approach, in an attempt to generate a model that can efficiently reproduce spectral measures. For the site-specific amplifications, the generic site amplification from the work of Klimis et al. (1999, 2006) were used, while for kappa values we considered the typical $\kappa 0$ values proposed for A/B, C and D NEHRP soil formations in Greece (Margaris and Boore, 1998, Margaris and Hatzidimitriou, 2002; Klimis et al., 1999, 2006). The results obtained in the present study (simulated Fourier spectra and time series) are in good agreement with the observed spectral measures (e.g. FAS). In accordance with the previous work, we stochastically simulate possible strong earthquakes that may occur along the shallow section of the Aegean subduction zone (e.g. 365 AD Crete earthquake).