Geophysical Research Abstracts
Vol. 13, EGU2011-9744, 2011
EGU General Assembly 2011

Comparison between Vs30 and Earthquake Amplifications, and their Reliability for Seismic Design Codes : Adapazari (Turkey) Case

Tazegul Ozcep (1), Ferhat Ozcep (2), and Oguz Ozel (2)

(1) Istanbul University, Institute of Science, Turkey (tazegul_ozcep@hotmail.com), (2) Istanbul University, School of Engineering, Department of Geophysical Engineering

The aim of the study is to verify if: (1) the average of shear wave velocity in the first 30 m (Vs30) of the soil is a good proxy of site amplification; and (2) relevant spectra in seismic design codes are adequate. To this aim, the soil amplifications obtained by both Vs30 measurements and earthquake data for different soil types in seismic design codes (Eurocode-8, UBC, etc.) are compared. Adapazari area is selected as study area, and shear-wave velocity distribution is obtained by Multi Channel Analysis of Surface Waves (MASW) at 100 sites for soil column of first 50 meters. For these sites, soil classifications are mapped according to the Eurocode-8, UBC (NEHRP) and the Turkish Seismic Design Code. Aftershock data, whose magnitudes range between 4.0-5.6, obtained by six stations (Babali, Seker, Genc, Hastane, Toyota and Imar) that installed in and around the Adapazari basin are used to estimate site amplifications by using Reference Station Method. Furthermore, fundamental periods of station sites are estimated by Single Station Method (Nakamura technique or H/V method). The site classification, based on Vs30 in seismic design codes, are compared with fundamental periods and amplification values that obtained by using earthquake data. Site responses defined in seismic design codes according to Vs30 are evaluated by fundamental periods and site amplifications. As a result, site amplifications (from earthquake data) and relevant spectra (from Vs30) are not in good agreement in basin type structures like Adapazari basin (Turkey).