SH3/TH/O15 **– PROBABILISTIC SEISMIC HAZARD ASSESSMENT FOR THE AREA OF GREECE: EVALUATING THE CONTRIBUTION OF COMPLEX GEODYNAMIC ENVIRONMENTS**

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Probabilistic analysis (PSHA) remains the main seismic hazard assessment methodology during the last decades since its development in the late seventies. A highly complex seismotectonic environment described by neotectonic basins, where the epicenters of destructive earthquakes are observed, and the existence of an active subduction interface, makes seismic hazard calculation for the area of Greece a demanding task. In attempting to include the contribution of the aforementioned geotectonic features since the non-instrumental era of seismology, seismic source models for the PSHA methodology are re-evaluated. Individual fault source model activity is connected with linear seismic sources related to either high or low seismicity rates. The activity of fault sources is assumed to be governed by bounded Gutenberg-Richter law behavior. The calculation of rates of exceedance of various ground motion levels imposes a Poissonian earthquake occurrence model. However, using only a fault-source seismicity model appears to be far from adequate since a significant percentage of seismic activity cannot be attributed to a causative fault. The above reasoning leads to the introduction a smoothed-gridded seismicity model into the seismic hazard calculations, which allows for the calculation of seismicity parameters for hypothetical point and linear seismic sources. The role of the smooth-gridded seismicity modelis to account for the possibility that future strong earthquakes might occur in areas of moderate historical seismicity, and that a percentage of earthquakes of considerable magnitude occur off known faults. Finally, a uniform background zone accounts for the seismicity attributed to the on-going subduction of the African lithosphere in the Aegean region. A three dimensional grid with varying hypocentral depths is used to describe the intermediate depth seismic activity of the outer and back-arc region, characterized by different attenuation characteristics and seismicity rates. For each source model the seismic hazard calculation at a particular site is described through the total seismic hazard curve, which has been developed after stacking the seismic curves that correspond to individual seismic sources. The total hazard for each site of the grid is determined as the weighted sum of the ground motion levels of each seismic source model. The estimated ground motion levels, for given rates of exceedance, include peak ground acceleration and velocity, as well as spectral acceleration for discrete period estimators. Recognizing the necessity for site specific seismic hazard evaluation, constant shape design spectra as well as uniform hazard response spectra for given return periods have been produced for three sites corresponding to major cities of Greece, including Athens metropolitan area.