Ground motion models for north-western Turkey using the 1999 Izmit aftershocks

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We present preliminary ground motion models for north-western Turkey using the aftershocks of the M_w 7.4, 1999 Izmit earthquake. We consider more than 4000 records from about 500 earthquakes recorded at stations belonging to both velocimetric and accelerometric networks. The velocimetric networks are the permanent Sapanca-Bolu (SABO) network (Grosser et al., 1998) and the temporary German Task Force (GTF) network while the accelerometers belong to the permanent and temporary networks operated by the Kandilli Observatory and Earthquake Research Institute (KOERI). The ground motion models are derived for peak ground velocity (PGV), peak ground acceleration (PGA), and spectral accelerations (SA) for 5% critical damping at 12 frequencies between 0.5 and 25 Hz. The attenuation relationships are derived for both the larger horizontal and vertical components in the local magnitude range 0.5-6 and for hypocentral distances up to 190 km. We used the random effect model (Brillinger and Priesler, 1985; Abrahamson and Youngs, 1992; Joyner and Boore, 1993) to estimate the component of variance related to the earthquake-to-earthquake, station-to-station and record-to-record variability. The inter-station distribution of error is used to investigate the presence of significant site amplification effects, that have been checked independently using the horizontal-to-vertical (H/V) spectral ratios. The preliminary results of regression analysis performed considering a binary site classifications are also presented.