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A revised intensity attenuation relationship for Turkey

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Although empirical attenuation relationships that predict ground motion parameters such as PGA, PGV and SA's are dominantly used in practice, intensity attenuation relationships are still needed and used in loss assessment studies associated with for example insurance sector, industrial facilities and non-structural elements and in countries with moderate seismicity where relatively few strong motion data exist.

There are two intensity attenuation relationships developed for Turkey. Ohashi et al. (1983) relationship includes earthquakes (Ms>4.8) that took place between 1928 and 1976 along North and East Anatolian faults and in the complex extensional sytem in Western Turkey. Erdik and Eren (1983) on the other hand used only strike-slip earthquakes (Ms>6.3) associated with the North Anatolian fault in the development of their intensity attenuation relationship. In the last 25 years a number of destructive earthquakes took place in Turkey. The purpose of this study is to revise existing relationships by including new data from recent earthquakes. A second aim is to come up with a relationship that can readily be used in probabilistic seismic hazard studies. In our data set there are 70 isoseismal maps of earthquakes with magnitudes Mw>5.0 that took place between 1912 and 2002. The equations give seismic intensities in terms of moment magnitude and distance for strike-slip and other (normal and complex) faulting mechanisms and are for average site conditions.