



Attenuation model for the seismic ground motion induced by Vrancea intermediate-depth earthquakes

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A classical probabilistic approach in seismic hazard analysis uses for the estimation of the ground motion level at a site the attenuation relations, empirically determined through multiple regressions. In order to predict the effects of strong Vrancea earthquakes we have obtained attenuation relations using a data set composed by the peak ground horizontal acceleration from intermediate depth earthquakes with $4.0 \leq M_W \leq 6.0$ occurred from 1997 to 2007 and recorded by the digital accelerometer network in Romania. The database contains also the strong motion records of the August 1986 ($M_W=7.1$) and both May 1990 earthquakes ($M_W=6.9$; 6.4 respectively). Previous experience in site effects evaluation lead us to the choice of a set of correction factors for the observed accelerations in order to consider the local soil conditions at the recording stations.

We have analyzed and compared several attenuation relationships in terms of acceleration considering the observed directivity of past earthquakes (NE-SW and NW-SE) and two segments of depths ($60\text{km} \leq h \leq 110 \text{ km}$ and $110 \text{ km} < h \leq 180 \text{ km}$) according to the adopted source model.

Even exposed to controversial interpretations, predictive equations represent a practical option in rapid ground motion evaluation at a vulnerable site and a possible damage indicator for decision-making factors when a strong earthquake occurs.