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# Spectral Attenuation of Strong Motions for Near Source Motions in Iran

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The attenuation of the Iranian strong motions is studied using the Iranian strong motions database. This database comprises 2000 three-components well recorded data (analog and digital) for which the teleseismic source parameters were available, or calculated from the strong motion records. The one-step regression method used in this study in order to develop the attenuation model:

$\ln Sa = a1 (M-6) + a2 (M-6)^2 - \ln X + c + \sigma.P$

Where A is strong motion parameter, M is the moment magnitude, X is the hypocentral distance, and the coefficients *a, b and* $c_i$ are the coefficients of magnitude, distance and site effects (as $c_1$, $c_2$, $c_3$, and $c_4$for the four-class site classification) respectively. The sigma term represent the 84.1% standard deviation with P=1.

The spectral values of the recorded strong motions in Iran are used to derive the empirical attenuation laws for different response spectral ordinates, on different site conditions. The strong motions are selected based on their peak acceleration value (having a PGA of 0.05g on at least on one component and the good signal quality in the low frequency band of 0.3Hz or lesser). The empirical relationships are established for the spectral acceleration as a function of the moment magnitude, the hypocentral distances, and a constant parameter representing the site conditions. The one and two step approaches for the regressions are applied, and the results are found to be near to each other, while the results for the one step approach are just presented in this paper. The data set consists of 100 three component accelerograms, all recorded during

1975-2003. The new attenuation coefficients are in general agreement with the previous attenuation coefficients established for Iran. However the spectral values obtained from the new law show greater values comparing to that of the previous law (1999 and 2006). The difference might be inferred according to the selection of greater motions recorded in the nearer distances to the seismic source.