

# Attenuation Relationships for Iran

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*The purpose of this study is to derive the attenuation relationships for PGA, PGV, and EPA parameters for areas within the seismic zones of Zagros, Alborz and Central Iran with rock and soil substructures. In order to do so, at first the available scientific data including the methods used for deriving attenuation relationships and the parameters involved have been gathered. Afterwards, all the efforts have been focused on gathering a thorough catalogue of earthquakes occurred in Iran. In this regard, a majority of the available catalogs in Iran have been gathered and corrected through different methods and finally a set of 89 earthquake events including 307 earthquake records with reliable data was chosen.*

*Since in order to derive the attenuation relationships it is essential to extract the parameters from the acceleration records, a great effort was placed on gathering the earthquake acceleration records of Iran. This resulted in building a database of a majority of the earthquake records up to the year of 2004. Afterwards, correction methods applicable to earthquakes records of Iran considering the type of machines used and the ground type were examined which resulted in certain guidelines for correction of earthquake acceleration record data related to Iran.*

*In the next step the needed parameters were extracted from the earthquake acceleration record data which were consequently divided into two seismic zones of Zagros, and Alborz and Central Iran according to tectonic conditions. After examination of the parameters and choosing the most appropriate among them, the attenuation relationships were derived for such parameters.*

**Keywords** Attenuation Relationship; PGA; PGV; EPA; Rock; Soil; Iran

## 1. Introduction

Iran is one of the most seismic countries of the world. It is situated over the Himalayan-Alpide seismic belt and is one of those countries, which have lost many human lives and a lot of money due to occurrence of earthquakes. Figure 1 shows recent seismicity of Iran [Tavakoli and Ghafory-Ashtiani, 1999].

Some of the destructive earthquakes occurred in Iran are Tabas in 1978 with magnitude of 7.7 (19,600 dead and 16 villages destroyed), Rudbar-Manjil in 1990 with magnitude of

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