

## Presenting Relations for Generating Synthetic Accelerograms in Iran Plateau Using Stochastic Approach

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With growing of civilization and population in urban areas, the seismic vulnerability of man-made structures is also growing. This is more significant in regions with high seismic hazards. Iran Plateau is located at the second most seismic belts of the earth, and many cities and urban area are located in high seismicity regions. On the other side, an accurate seismic analysis and design of structures requires realistic and representative strong motion records of the building area. However, such a strong motion record is not available for any region, or there are not sufficient numbers to accurately represent random and stochastic nature of the earthquakes. Putting all these together, the need for generating synthetic strong motion records or accelerograms that are coherent with the source and site characteristics of any area is highlighted.

Amongst different approaches to generate synthetic accelerograms, one is empirical simulation using stochastic models based on the statistical characteristics of ground motions of the area. This approach was recently utilized to generate synthetic accelerograms for a seismic source, which are different in seismic parameters [1]. The present study is using this approach and accelerograms of two horizontal components of about 258 events in Iran Plateau recorded by Iran Strong Motion Network (ISMN) with the moment magnitude greater than 5.5. Seismic parameters of these events are extracted with regression analysis and used to develop empirical relation for generating synthetic accelerograms for two site conditions of shear wave velocity smaller and greater than 600 m/s in two components of parallel or perpendicular to the fault. The performance of the relations is verified by comparing the synthetic accelerograms with the actual records of Avaj 2002 earthquake with the moment magnitude of 6.4, Figure (1). Furthermore, the response spectrum of the synthetic records of this event is compared with the standard response spectrum of the recent version of Iran seismic code 2800 for the Avaj area, Figure (2).

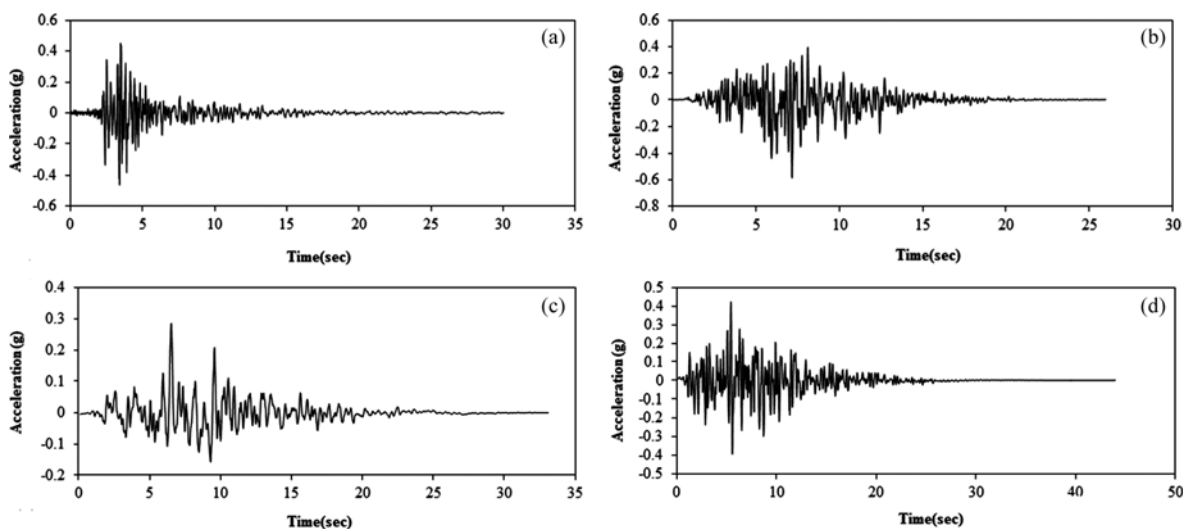
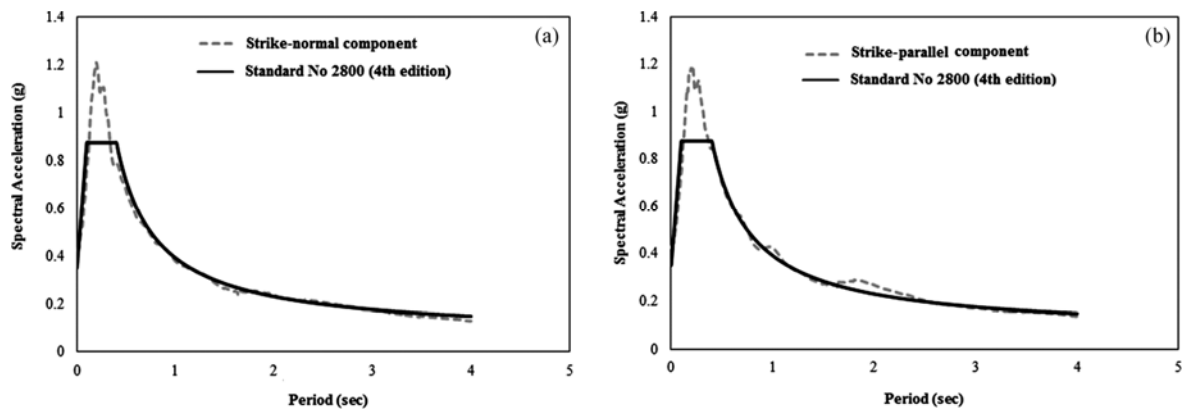


Figure 1. Recorded and Synthetic accelerograms of Avaj 2002 event.



**Figure 2.** Response spectrum of synthetic records and Standard spectrum of Iran seismic code 2800-v4 for Avaj area

**Keywords:** Synthetic Accelerograms; Iran Plateau; Stochastic Model; Regression Analysis; Reverse Fault; Response Spectrum.

#### Reference

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