

A New Seismo-Engineering Ground-Motion Database for Israel

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The seismic activity in Israel and its surrounding neighbors originates mainly from the active Dead Sea transform. The historical and archaeological records suggest a recurrence interval of approx. 10^2 and 10^3 years, for earthquakes of M_6 and M_7 , respectively. Despite the existing hazard, local advancements on this topic have been slow and incremental, partly due to objective challenges, such as the limited number of recorded significant earthquakes and a limited azimuthal coverage. Consequently, limited effort to date has been made to compile all of the available data into one standardized, open resource for the scientific and engineering communities. This project is a joint effort, aimed at standardizing the catalog and creating a publicly-available ground motion database for Israel. The database is compiled of three main branches: the event database, the ground motion recording database and the site database.

The event database is composed of over 400 events, and is a subset of the formal catalog published by the GII. We selected events with $M_d > 5.0$ between 1983 and 2007, and $M_d > 3.0$ since 2008.

The ground motion recording database is composed of over 3100 records having two horizontal components, and over 2900 records having all three components. The raw time-history data is processed following a protocol suggested by the Pacific Earthquake Engineering Research institute (PEER) and the Reference database for seismic ground-motion in Europe (RESORCE). Then the full Fourier Amplitude Spectra of the processed acceleration record is obtained at discrete frequencies, as well as peak values, such as PGA and PGV.

The station database compiles all available data regarding ISN station characteristics, as well as new field measurements collected systematically for the first time in the history of ISN. Surface - wave dispersion measurements allow us to obtain both the full shear-wave velocity (V_s) profile down to the available depth, as well as other proxies used for site response evaluation, such as the time-averaged shear wave velocity of the upper 30 meters, a parameter known as V_{s30} . At this point, we have a complete database for 23 out of 25 seismometer stations, and 29 out of 60 strong motion stations. This database is constantly growing as we continue to conduct field measurements at station locations.