

Usability of the next generation attenuation equations for seismic hazard assessment in Malaysia

Abstract

This study investigated the applicability of five popular seismic attenuation equations developed under the Next Generation Attenuation (NGA) project, for Peninsular Malaysia condition. These five equations were originally developed by Campbell and Bozorgnia, Chiou and Youngs, Boore and Atkinson, Abrahamson and Silva, and Idriss. Published in 2008, these models were actually meant for the Western United States. Therefore, the objective of this study was to investigate the suitability of using these NGA models in predicting ground motion for Peninsular Malaysia. Earthquakes data obtained from the United States Geological Survey database surrounding Peninsular Malaysia were attenuated to a distance of 400 km, indicating similar distance between the Sumatran strike-slip faults to Kuala Lumpur city. Comparisons between the five NGA models revealed that Abrahamson and Silva's model performed better in attenuating longer distance seismic waves as the peak ground acceleration (PGA) value obtained was closer to the pre-existing seismic hazard maps for the region. However, a closer study indicated a strong need for the NGA model to be fine-tuned and calibrated because the gap of discrepancy with the existing PGA values was still not negligible.