

Influence of GMPEs on Site-specific Uniform Hazard Spectra. Case study for Iasi, Romania

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Iasi City, situated in N-E part of Romania, with a population in excess of 300,000 inhabitants, is almost solely subjected to seismic hazard originating from Vrancea intermediate-depth seismic source. Some site-specific results of the probabilistic seismic hazard analysis (PSHA) for Iasi City, obtained within the BIGSEES national research project (<http://infp.infp.ro/bigsees/default.htm>), are presented hereinafter.

The information on the seismicity of Vrancea intermediate-depth seismic source is obtained from ROMPLUS earthquakes catalogue of National Institute for Earth Physics of Romania (<http://www1.infp.ro/catalog-seismic>). Details on the seismicity parameters for the PSHA can be found in (Vacareanu et. al, 2016).

For the PSHA in Iasi, two ground motion prediction equations (GMPEs) developed for Vrancea intermediate-depth seismic source are used, namely VEA14 (Vacareanu et al., 2014) and VEA15 (Vacareanu et al., 2015). For comparison purposes, both GMPEs are applied for average soil conditions in the analysis. VEA15 is an improved GMPE since it is calibrated on an extended database, if compared to VEA14; moreover, VEA15 provides faster attenuation in the back-arc region (with respect to the Carpathians Mountains) than in the fore-arc region, whilst VEA14 provides the same attenuation no matter the position of the site with respect to the Carpathians Mountains. Since Iasi City is situated in the fore-arc region, both GMPEs provide consistent results. The main outcome of the PSHA, represented by the uniform hazard spectra obtained with VEA14 and VEA15 GMPEs, is highlighted, and the influence on the results produced by the improved GMPE is discussed.

Finally, the combined influence of magnitude-focal depth on the total hazard is investigated. The disaggregation of seismic hazard (Bazzurro & Cornell, 1999; McGuire, 1999, 2004) is performed in order to determine the mean causal values of magnitude, source-to-site-distance and epsilon.

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