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Deterministic Seismic Hazard Assessment of the inner town of Budapest

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Deterministic seismic hazard computations were performed along different profiles across the downtown of Budapest. Synthetic seismograms were computed by the so called “hybrid technique”. The parameters of the seismic source were adopted from the parameters of the well-known 1956 Dunaharaszti earthquake. The focal mechanism and the homogeneous and heterogeneous parts of the profiles are known from geophysical and geological data of the investigated area.

As the results of the computations PGA grid maps of the downtown of Budapest for the three different components came into existence. Furthermore spectral acceleration (SA) and RSR charts of the synthetic seismograms for the different profiles were created. The PGA grid maps show that the maximal PGA values are situated at the eastern (Pest) part of the downtown, and their values are 50-200 cm/s2.

For the downtown of Budapest a special seismic risk map have been prepared. This special seismic risk map were created on the basis of the difference between the maximal amplitude frequencies of SA of synthetic seismograms and the building’s eigenfrequencies at every 0,1 square km of the downtown.

In order to determine the building’s eigenfrequencies microseismic noise measurement were performed at 6 different buildings in the downtown. The special seismic risk map shows that the buildings situated at the hilly western section of the downtown have higher seismic risk than the ones at the flat eastern part.