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## Earthquake Ground motion scenarios for three cities in Bulgaria

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Earthquakes are the deadliest of the natural disasters affecting the human environment, indeed catastrophic earthquakes have marked the whole human history. Global seismic hazard and vulnerability to earthquakes are increasing steadily as urbanization and development occupy more areas that are prone to effects of strong earthquakes. Additionally, the uncontrolled growth of mega cities in highly seismic areas is often associated with the construction of seismically unsafe buildings and infrastructures, that are undertaken with an insufficient knowledge of the regional seismicity and seismic hazard.

The territory of Bulgaria represents a typical example of high seismic risk area in the eastern part of the Balkan Peninsula. Over the centuries, Bulgaria has experienced strong earthquakes. At the beginning of the 20<sup>th</sup> century (from 1901 to 1928) five earthquakes with magnitude larger than or equal to  $M_S=7.0$  occurred in Bulgaria. However, no such large earthquakes have occurred in Bulgaria since 1928, which may induce non-professionals to underestimate the earthquake risk. Bulgaria contains important industrial areas that face considerable earthquake risk. Moreover, the seismicity of the neighboring countries, Greece, Turkey, former Yugoslavia and Romania influences the seismic risk in Bulgaria.

The assessment of seismic hazard and generation of earthquake scenarios is the first link in the prevention chain and the first step in the evaluation of the seismic risk. The use of earthquake scenarios in combination with modern methods of seismic engineering can reduce, to a great extent, the damage and casualties from a strong earthquake.

In the present study deterministic and probabilistic earthquake scenarios for the cities of Sofia, Plovdiv, Varna, Ruse and Veliko Tarnovo are presented. The basic approach used for the creation of ground motion maps incorporate in GIS mode the source-geometry, earthquake occurrence model, the strength of the earthquake sources, and the appropriate attenuation relations.

Earthquake scenarios are a powerful tool to support disaster management decisions. Successful preventive measures and planning of post-earthquake activities are based on scenarios of expected damage, destruction and casualties from predicted strong seismic impacts. The implementation of the earthquake scenarios into the policies for seismic risk reduction will allow focusing on the prevention of earthquake effects rather than on intervention following the disasters.