Geophysical Research Abstracts
Vol. 18, EGU2016-5616, 2016
EGU General Assembly 2016

Beijing Basin's amplification effect on long-period ground motion

Changhua Fu
Institute of Geophysics, China Earthquake Administration. Beijing, China

A lot of high-rise buildings are located in basins. Previous researches tell us that the intensity of long-period ground motion in the basin is usually larger than that in its vicinities when a strong earthquake occurs. This higher intensity will cause severe damage to high-rise buildings which have long self-vibrating periods. So, by studying the characteristics of ground motion in the basin and analyzing basin amplification effect on long-period ground motion, we can understand reasonable seismic fortification requirement of high-rise buildings in the basin, and provide scientific reference for city future planning, earthquake emergency and rescue.
Taking Beijing Basin as an example, we set up several scenario earthquakes, then use Ground-Motion-Simulation method to study how different scenario earthquakes influence basin's amplification effect on long-period ground motion. The research demonstrates that the amplification effect on 3∼10-second ground motion acceleration response spectrum is mainly controlled by thickness of sediment in basin, although different seismic sources may cause the uncertainty to a certain extent. Thus, the average basin's amplification factor on 3∼10-second ground motion acceleration response spectrum is computed, and the correlation function, that between the average amplification factor and equivalent thickness of sediment in basin, is analyzed. Finally, according to the distribution of high-rise buildings in Beijing Basin, preliminary discussion on the relationship between risk level of seismic hazard of high-rise buildings and basin structure is made.