The Study of the Seismic Hazard Factors in SW Taiwan by using 3D Ground Motion Simulation: Application in 2016 Meinong Earthquake

*Kuan-Ting Tu[1], Strong Wen[1], Chau-Huei Chen[1]

1. Institute of Seismology, National Chung-Cheng University Minhsiung, Chiayi, Taiwan

The M_L6.6 Meinong earthquake occurred in Kaohsiung, Taiwan in February 6, 2016. The major seismic damage was occurred in Tainan area, which including houses collapse and soil liquefaction. Ground motion variability exhibited strong lateral variations owing to the heterogeneous subsurface structure, lower velocity layer and topographic effect. Many factors cause of amplification which include rupture directivity, local structure variation, and wave propagation effects. To study seismic wave field variance and major seismic hazard factors, we examine the variability of the Meinong earthquake ground motion from 3D seismic wave propagation simulation through a set of models with 3D velocity structure, shallow structure (include V_s30 and Z1.0) and topographic data. The kinematic model of 2016 Meinong earthquake was described in the finite fault source model by using isochron synthetic method. The result shows that the maximum intensity was located in Tainan area, it might cause by the source rupture directivity. In the station of the Western Plain, seismic wave amplification correlates with soft sediment; and the stations on the Western Foothill, the amplification might cause by ray focusing form the asperity and topography. The collective results indicate that the rupture directivity, near-surface soft layer, ray focusing and local topographic effect are most important for amplification. Thus, the 3D ground-motion simulation plays an important role in seismic hazard assessment.

Keywords: 3D Ground-motion simulation, Southwestern Taiwan, The 2016 Meinong earthquake, Seismic hazard

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