

A revised PSHA for the southwestern Taiwan by matlab-based CU-PSHA software: influence of the 2016 M_L 6.4 Meinong earthquake

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A recent strong earthquake damage induced by intermediate magnitude (M_L 6.4) in Meinong, SW Taiwan in 2016 compelled scientists and engineers to re-investigate the seismic hazard potential in this area. In this study, we intend to generate ground-shaking hazard maps in the southwestern Taiwan which provide effective basis for mitigating against future earthquakes. We modify matlab code from CU-PSHA software, by considering the local geological setting, to suitable for the area of SW Taiwan. Moreover, the code can be better parameterized to improve probability seismic hazard analysis (PSHA) method and seismic sources. The earthquake catalogue compiled by the Taiwan Earthquake Center (TEC), Taiwan, was used to calculate for different sources of earthquake ground shaking, including shallow regional, subduction intraplate and subduction interplate sources. And the newest data about fault source, which identified by TEM geologists, are used in this study. The highest hazard probability is evaluated to be around the city of Tainan, which is similar to the levels determined in previous studies and matched quite well with the shake map of the Meinong earthquake. The 2016 earthquake has changed the regional stress state, probably to some significant extent. As a result, the geological characteristics of the region to calculate PSHA map could be affected and then changed. In this study, we try to generate a new seismic hazard map for this region, which is used updated earthquake catalog, by short-term probabilistic seismic hazard assessment, which depends on the aftershock duration and the magnitude of Coulomb stress change. The result shows a significantly higher hazards at the periphery of the epicenter of the Meinong earthquake.