

Coseismic deformation and tectonic implications of the 2016 M6.6 Meinong earthquake, Taiwan

*Ray Y Chuang¹, Kuo-En Ching², Manabu Hashimoto³, Ruey-Juin Rau⁴, Ling-Ho Chung⁵

1. Department of Geography, National Taiwan University, 2. Department of Geomatics, National Cheng Kung University, 3. Disaster Prevention Research Institute, Kyoto University, 4. Department of Earth Sciences, National Cheng Kung University, 5. Department of Earth and Environmental Sciences, National Chung Cheng University

A M6.6 earthquake occurs at Meinong, Taiwan at 03:57:27 on February 6, 2016 local time (UTC+8). This earthquake caused severe damage and 117 deaths around several towns of Tainan City. We estimate coseismic displacements from continuous GPS and InSAR images. We process GPS daily solutions and calculate coseismic displacements from the differences between average positions for seven days before the earthquake and average positions for four days after the earthquake. The maximum horizontal displacement is about 5 cm and maximum vertical displacement is about 9 cm from GPS. We conduct dislocation models to estimate fault slip and fault geometry and the results show that the main slip area is at depths of 10-20 km and the orientation of the fault plane is E-W dipping to the north. In addition, we process ALOS2 images and the results show a region of deformation 10 km west of the hypocenter. The deformation region shown in InSAR results indicates deformation in mudstone at shallow depths, which is different from the dislocation model. This shallow deformation pattern is consistent with preseismic deformation pattern constrained from PS-InSAR and leveling. The shallow deformation might be controlled by local stress condition in the mudstone area.

Keywords: Coseismic deformation, InSAR, GPS