

Dense seismic array for the 2018 Mw6.4 Hualien earthquake, Taiwan: Aftershock sequence and Vp tomography

Wei-Fang Sun^{1,2}, Zhuo-Kang Guan³, Pei-Yu Jhong³, Hao Kuo-Chen³, Chien-Ying Wang³, and Wen-Yen Chang^{1,2,4}

1 Department of Natural Resources and Environmental Studies

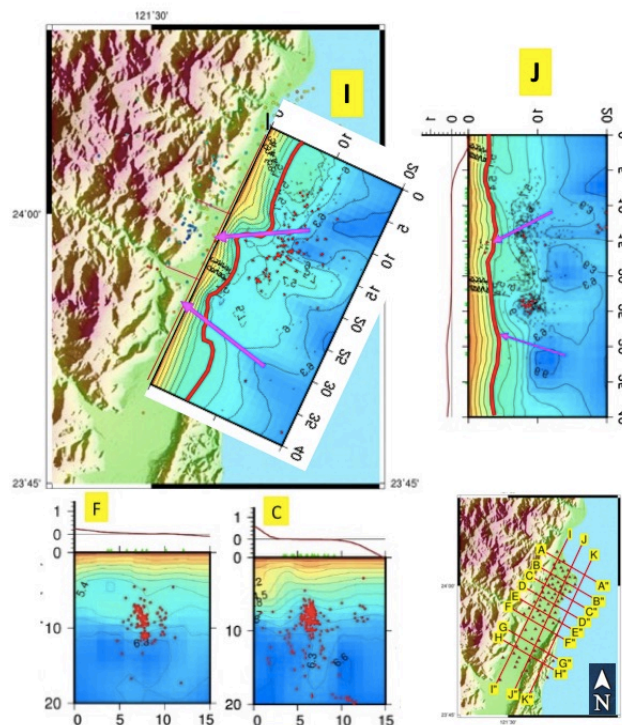
2 Eastern Taiwan Earthquake Research Center

3 Department of Earth Sciences, National Central University

4 National Center for Earthquake Engineering, National Applied Research Laboratories (NARLabs)

Abstract

After the 20180206 Mw6.4 earthquake struck the Hualien area, a self-organized research team from Central University, Academia Academia, and National Dong Hua University, from Xincheng to the north bank of the Shoufong river, evenly deployed 70 vertical-component TEXAN seismographs to collect a total of 10 days of dense seismic records from February 8th to 18th. We manually detected 4,206 aftershocks and then picked, located and relocated 2,418 of the aftershocks by hypoDD. Three aftershock clusters were located at Hualien, Jian, and Shoufeng, and they have identical focal mechanism whose strikes are slightly different from 27, 38, and 47 degrees, respectively. It may be related to the horsetail-like structure that is generated at the end of a strike-slip rupture. Furthermore, we use the relocated aftershocks and their P-wave arrivals as input and obtain the three-dimensional velocity structure by finite difference travel time tomography (Roecher et al., 2006). Due to the dense seismic network (~1-3 km spacing) and events, a large number of traces were well distributed to obtain the detailed shallow structure (< 10 km) that is obtained for the first time.



P tomography of the Hualien obtained from the aftershocks of the 2018 Mw6.4 Hualien earthquake.