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

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Abstract

After the 20180206 Mw6.4 earthquake struck the Hualien area, a self-
organized research team from Central University, Academia Academy, 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.