

## Multiple-fault triggering induced by the February 2018 Mw 6.4 offshore Hualien earthquake, Taiwan: insights from geodetic measurements

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The Mw 6.4 earthquake occurred on February 6<sup>th</sup>, 2018 in the offshore area of Hualien city. This area is located at a complex junction between the extended portion of the Longitudinal Valley, the active fault system in the north part of the Coastal Ranges and the Ryukyu forearc system. The focal mechanism of main shock demonstrates a NE-trending reverse fault dipping to the west with left-lateral strike-slip component responsible for the coseismic deformation observed in the epicentral area. However, a larger coseismic deformation is observed both in the hanging wall and the foot wall of the east-dipping Meilun and Lingding faults (up to 46 cm in the horizontal and 9 cm in vertical coseismic deformations). The left-lateral strike-slip coseismic deformation is predominant along the Meilun fault. In addition, the coseismic deformation changes in the southernmost part of the Meilun fault, which implies that the Meilun fault and the north segment of the Lingding fault should belong to the different fault systems. It is worthy to note that a larger coseismic uplift is observed along the foot wall of the north segment of the Lingding than in the hanging wall part which shows a significant western motion. The southwestern coseismic motion observed in the Longitudinal Valley is different from the southeastern coseismic motion near the epicentral area predicted according to an oblique-dip faulting. This implies that an unknown fault system located near the foot wall portion of the Meilun and Lingding faults could also have been triggered during the 2018 Mw 6.4 offshore Hualien earthquake. The coseismic deformation from D-InSAR of both ascending and descending orbits from ALOS-2 and Sentinel-1 radar images show similar results to those obtained from our continuous GPS measurements and support the idea of multiple-fault ruptures during the 2018 Hualien earthquake.

Keywords: GPS, In-SAR, Multiple-fault triggering