# Coseismic deformation along the Huaxi Road in the Milun Fault surface rupture zone of 2018 Hualien earthquake, Taiwan.

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The 2018 Hualien earthquake caused more than 200 casualties, and the $M_L$ 6.2 earthquake also produced hundreds of tension cracks in the Milun Fault surface rupture zone. The horizontal coseismic displacement in the east of Milun Fault is about 50 cm to the northeast relative to the west block of the fault. Several releasing and restraining bends formed during the earthquake due to the curved shape (apex to the west and widens to the east) of fault trace, and made damage to pavement, road curb, walls, and other man-made structures.

To understand the influence of coseismic deformation on nearby utility lines, the Huaxi Road is selected as an example due to several service lines are underneath the road. All cracks in the study area are located by RTK-GPS, and we also measured proximately coseismic deformation by comparing a pair of aerial photos which took before and after the earthquake. The deformation pattern of larger area is provided by InSAR data which calculated from Sentinel-1A and 1B images.

The result showed the major extension direction in the Huaxi Road area is NE-SW, which is sub-parallel to the strike direction of Milun Fault in the same area. The total amount of extension along the Huaxi Road is approximately 60 cm, which is consistent with the coseismic GPS horizontal displacement. The length of horizontal displacement vectors carried out by aerial photos correlation method ranges from 10 to 70 cm. This study identified five major extension zones along the Huaxi Road based on the distribution of cracks and are coincided with the E-W deform gradient calculated from the InSAR data. The result will helping the future earthquake hazard assessment of utility lines in this area.