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Identification of the surface traces of historical earthquakes: one example from the southeast margin of the Tibetan Plateau

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The surface traces of historical earthquakes on the optical images are easily obscured by dense vegetation. Fortunately, the vegetation can be filtered and removed mostly or completely from LiDAR-derived cloud point data. We incorporate tectono-geomorphic interpretations of optical image, digital elevation model (DEM)-derived hillshades, contour maps, and field observations of tectono-geomorphic features and trenches to identify surface traces created by a historical earthquake. Based on DEM data, we used LaDiCaoz_v2_1 and 3D_Fault_Offsets to quantify offsets of tectonically displaced geomorphic markers. These approaches help us to recover an Mw7.5 historical earthquake at the southeast margin of the Tibetan Plateau, but the seismogenic fault had been considered as a weakly active fault and the magnitude of this earthquake was cited as M6.8 in the catalog of Chinese historic strong earthquakes from BC 2300 to AD 1911.