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# Creep Deformation along the Longtudinal Valley fault at Yuli, Eastern Taiwan, revealed by leveling, 2008-2009 (3)

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Longitudinal valley faults in eastern Taiwan are commonly considered collision boundary between the Eurasian plate and Philippine sea plate. Yuili fault, one of the active segments of the longitudinal valley faults, is reverse fault with east dip.
We established about 30km leveling route from Yuli to Changbin to detect the vertical deformation in detail (Murase et al. 2009). The installation interval of benchmarks near the fault area is about 100 m. Others were installed every about 300m. Compared to the 2km installation interval of the Geological Survey Institute, Japan for making the map, installation interval of our survey is dense. The precise leveling surveys were conducted in August 2008 and August 2009. The overview of the deformation detected in the period from 2008 to 2009 is as follows. It was detected about 2.7 cm uplift, referred to the west end of our route, at about 2km region across the fault. Uplift was gradually-reduced with the distance from the fault, and was 1.5 cm at the east coast. In the observation period, there is no significant earthquake in Yuli fault. It suggests the detected deformation as a cause for the creep motion of the Yuli fault.
From this result, the creep distribution was estimated in the Yuli fault. We adopted a two-dimensional reverse fault model to estimate the creep distribution. Chen et al. (2010) discussed shallow part of the fault geometry using the seismic reflection survey in Yuli fault. Since the route of the seismic reflection survey was located near our leveling route, we adopted the shallow part of the fault geometry that was detected by using the seismic reflection survey. The deeper part of the fault geometry was optimized using the genetic algorithm in order to conform to the leveling data. The goodness of the fit of the examined models is determined on the basis of Akaike's information criteria (AIC).

Keywords: Taiwan, Longtudinal Valley fault, Creep, leveling