



Partly stick-slip behavior of a creep fault, Chihshang Fault, eastern Taiwan

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The 2003 Chengkung earthquake in eastern Taiwan occurred on the part of Chihshang Fault, which is the active creep fault segment of the Longitudinal Valley Fault. In order to understand the rupture history of the Chihshang fault, we performed paleoseismological trench excavations at Jinyuan site near Chihshang Township across the 2003 Chengkung earthquake rupture and fault trace of the Chihshang Fault.

Both monocline deformation and fault strands exposed in the trenches with agitated late Holocene fluvial deposits. The monocline deformation of the young sedimentary layers shows the creep fault behavior based on the consistent of the creep rate and the slip rate of hanging wall terrace. The fault strands revealed 2003 event with a vertical separation of 8 cm and previously four events with a vertical separation of 20-65 cm which in each event. Based on radiocarbon dates of the fluvial deposits and historical explanation, we suggesting the recurrence interval of less than 100 years and the minimum vertical uplift rate of coseismic events is 8.8 ± 1.2 mm/yr. We conclude that shortening rate was approximated the sum of the horizontal creep rate and the coseismic shortening rate. Accordingly, the Chihshang fault is a creep dominated fault with partly stick-slip behavior.