

Short rupture interval of the Daguchi fault, southwest Japan, inferred from pit excavations on a mountain slope

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A possible paleoseismological tool for active faults lacking trench sites is excavating a pit across a small up-hill facing fault scarp on a mountain slope, because sediments trapped by the scarp should preserve paleoseismic record with age control even on a mountain slope. A pair of pit excavations on a mountain slope across the Daguchi fault, north of Lake Biwa, southwest Japan, suggests a rupture interval of 2000-3000 years or less, which is quite short as that of a B-class active fault (i.e., active fault with slip rate of 0.1-1.0 mm/yr). One explanation for the short rupture interval of the Daguchi fault is that it reflects limited available rupture space of the fault (less than 12-13 km) due to exceptionally close and complicated active-fault spacing around the Daguchi fault. A short available rupture length indicates a small slip per event, finally leading to a short rupture interval given a fixed fault slip rate. Contrasts to this are Gomura and Shikano-Yoshioka faults, causative active faults for the 1927 Kita-Tango and 1943 Tottori earthquakes, which have long available rupture lengths of as much as 40 km and long rupture intervals of 4000-12000 years, in spite of similar slip rates and surficial lengths to the Daguchi fault.