

Two years GPS Campaign in Aceh: postseismic deformation and slip along the Sumatra Fault Zone (SFZ)

Irwan Meilano[1]; Yusaku Ohta[2]; Fumiaki Kimata[3]; Takeo Ito[4]; Takao Tabei[5]

[1] Earth and Planetary Sci., Nagoya Univ.; [2] Res. Cent. for Earthquake and Volcanic Eruption, Tohoku University; [3] Res. Center Seis. & Volcanology, Graduate school of Environ., Nagoya Univ.; [4] Environmental Studies, Nagoya Univ.; [5] Natural Environmental Sci., Kochi Univ.

The result of two years campaign-style GPS measurements gives a first order indication of heterogeneities in slip distribution of the coseismic and postseismic displacement. The latitudinal variation of geodetic displacement shows two distinct regions, region 1 around 4-4.5 and region 2 around 4.5-5.5. Average coseismic displacement at region 1 is 1.7m while at region 2 is 2.6m. Sudden discontinuities was detected at 4.5. Surface displacement discontinuities constrains width and distribution of the rupture area. Such physical discontinuities or interruptions to the fault surface may halt or interrupt rupture propagation, and the resulting stress increase at the fault ends may trigger rupture on the adjacent segment. In a way, we speculate that Sumatra-Andaman earthquakes consists of multiple smaller earthquakes where several segments have been triggered sequentially. A model of frictional afterslip explains to first order the evolution of postseismic deformation. Although its spatial distribution is poorly resolved, afterslip seems to have occurred over about the same width of the megathrust as coseismic slip.