

Spatial variation of creep rate on the Philippine fault based on alignment array surveys

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The Philippine fault is a typical arc-parallel strike-slip fault related to oblique subduction of oceanic plate. We identified evidence of surface creep on Leyte Island and estimated creep rate on the basis of offset cultural features. Since 2013, we set up alignment arrays across the surface trace of the Philippine fault to monitor surface creep at 16 locations from southern Luzon Island southward to Masbate, Leyte and Mindanao Islands. Creep rates of 23-29 mm/yr were estimated at two sites on Leyte Island, which are almost the same as a GPS-derived slip rate of the fault. This suggests that the slip on the Philippine fault on Leyte Island is accommodated by aseismic creeping. On Masbate, creep rates of 5-10mm/yr were estimated across the surface rupture of the 2003 Masbate earthquake (M_s 6.2), suggesting that the slip on the fault is accommodated by moderate earthquakes and aseismic creeping.