

When did arc-parallel extension begin in the southern Ryukyus?

Makoto Otsubo[1]; Daigoro Hayashi[2]; Atsushi Yamaji[1]; Shigeaki Yamada[3]; Hiroki Matsuda[4]

[1] Div. Earth Planet. Sci., Kyoto Univ.; [2] Physics and Earth Sci., Ryukyu Univ; [3] Natural Sci., Kanazawa Univ.; [4] Dept. Earth Sci., Fac. Sci., Kumamoto Univ.

Present stress field is dominated by arc-parallel extension in the Ryukyu Islands, by means of fault-striation analysis. We examined when the stress field emerged in the geologic past of the southern Ryukyus. We collected fault-slip data from late Pleistocene raised coral reef (Ryukyu Group) in the Miyako, Ishigaki, Kohama, Hateruma and Yonaguni Islands. The strata from which the data were obtained cover 0.125 to 1.0 Ma in age. Spatio-temporal variation of state stress allows was to divide the Southern Ryukyus into 3 tectonic domains; (1) Miyako to Ishigaki Islands, (2) Yonaguni island and (3) Hateruma Island. It was found that the arc-parallel extension emerged at around 0.1 Ma in the first domain. Arc-perpendicular extension predated the arc-parallel one. This result is one order of magnitude younger than that of previous researchers. However, the transition in the stress field was simultaneous with onset of the third rifting phase in the southern Okinawa Trough backarc basin.