内陸断層・弾性衝突を考慮した伊豆半島周辺の地殻変動モデリング

A crustal deformation model around the Izu Peninsula considering inland faults and elastic collision

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This study models crustal deformation focusing on inland faults and elastic collision around the base of the Izu Peninsula using GNSS(Global Navigation Satellite System) time-series data. First, in order to extract steady deformation, we correct the F3 solution data about antenna replacement from January., 2000 to January., 2010, and remove non-stationary variations using models of earthquakes, volcanic deformation and slow slip events. Next, we set elastic collisional power sources around the base of the Izu Peninsula, locking of plate boundaries, a deep creep of inland faults and a stationary volcanic deformation with a dislocation model and rotational motion of rigid bodies of the Izu micro plate and the Izu arc block (Nishimura, 2011). Then we perform an inverse analysis for the crustal deformation in this region.

The inversion result exhibits that elastic collisional power sources work at -12.7 mm/yr on the eastern foot of Mt. Hakone, 6.2 mm/yr on the northern foot, 11.6 mm/yr on the western foot and -0.5 mm/yr in the eastern Suruga bay. The plate boundaries are locked at 6 - 43.8 mm/yr beneath the Sagami trough, 3.6 - 39.3 mm/yr beneath the Suruga trough, 10 - 15.9 mm/yr in a southern edge of the Itoigawa Shizuoka Tectonic Line and 11 - 105.5 mm/yr on the boundary between the Izu micro plate and the Izu arc block. The inland faults creep at 23.3 mm/yr in deep extension of the Northern Izu fault zone and 23.4 mm/yr in deep extension of the Sagiriko Rokuroba fault group. In addition, the stationary volcanic deformation source at Mt. Mihara in the Izu-oshima island expands at 2.0×10^6 m^3/yr. Furthermore, for the Honshu, the Izu mirco plate rotates at -3.1 °/Myr with the Euler pole of 36.57 °N, 139.72 °E and the Izu arc block rotates at -11.3 °/Myr with the Euler pole of 34.95 °N, 140.46 °E. The spatial variations of the elastic collisional power sourses correspond to actual terrain around the base of the Izu Peninsula.

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