

Crustal movement of the forearc wedge of Nankai Trough based on offshore geology

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It is widely known that landward tilting of co-seismic crustal movement occurs in the coastal zone during subduction zone earthquakes along the Nankai Trough. Heights of Late Pleistocene marine terraces along the Pacific coasts of Shikoku Island and Kii Peninsula increase to the promontories that is located on the southern tips of the seaward bulges of the coasts, which has been attributed that a part of the co-seismic deformation of landward tilting has been accumulating repeatedly during the last a few hundred thousand years (1). Offshore geologic structure, however, does not show landward tilting near the coastal zone.

Fold and thrust belts parallel to the Nankai Trough have been growing along the Nankai accretionary prism seaward of the outer ridges bounding seaward margin of forearc basins. In contrast, gentle undulations that have differently directed axes with 100 km wavelength have formed in the wedge landward of the outer ridges.

Arc parallel undulations are composed of outer ridges, forearc basins and Shikoku and Kii Mountains. Geologic structure of landward tilting is limited in the seaward margin of the forearc basins and not observed under the shelves and landward slopes of the forearc basins. The arc-parallel undulations are punctuated by the N-S trending anticlines. The forearc basins are divided by the N-S trending anticlines that are inferred to have began to grow in early Pleistocene. These offshore geological structures indicate that the increase of the terrace height can be reasonably interpreted by the growth of the N-S trending uplift zones rather than by landward tilting (2).

The uplift of the Muroto Peninsula was attributed to the activities of a spray fault (3), however the N-S trending anticlines continue to the Shikoku and Kii mountains that have broad topographic high. No reverse fault is observed near the Shino-Misaki at the southern tip of the Kii Peninsula. The Kii and Bungo straits between the N-S trending anticlines have been subsiding. These crustal movements that consist of N-S trending broad uplift and subsidence zones are closely related, suggesting that the movements can not be interpreted by activities of spray faults.

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