

## Crustal deformation in southwestern Japan revealed by GPS observation

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Characteristics of crustal deformation in western Japan are investigated on the basis of GPS data by GSI. Although distinctive differences are observed in the spatial pattern of crustal deformation between northeastern Japan and southwestern Japan, we should be careful about influence of collision of the two blocks on the deformation within southwestern and northeastern parts of Japan (Miyazaki and Heki, 2002). Bearing the point in mind, we pick out several regional characteristics in southwestern Japan recognized in the spatial pattern of rotation field, divergence, shear stress, direction of principal axes, and investigate their tectonic meaning.

Following is a list of the characteristics we would like to take up.

1. A large anticlockwise rotation field is observed in the southeastern part of Kyushu.
2. Large horizontal southeastward displacement is observed at GPS stations in southern Kyushu.
3. A clockwise rotation field is conspicuous in the eastern part of Shikoku.
4. A considerable shear stress in the east-west direction is observed in the northwestern part of Shikoku.
5. Linear compression in the east-west direction is noticeable in the western part of Shikoku, while linear compression in the north-south direction is noticeable in the northeastern part.
6. Strain rate in the Chugoku district is small compared to Kyushu and Shikoku. It is to be noted, however, that directions of the principal axes of strain around the focal region of the 2000 western Tottori earthquake was apparently different from those in the surrounding region.

As for the remarkable movement of land toward the southeastern direction in southern Kyushu, Kodama considered anticlockwise rotation of blocks presenting paleomagnetic evidence for the idea, Nishimura (1999) suggested a slip following M6 interplate earthquakes in Hyuganada, and Seno (1999) proposed mantle upwelling in the East China Sea. However, the movement is too large to explain it by the afterslip of earthquakes, and it may be not appropriate to consider a source in the west of Kyushu, because the strain seems larger on the eastern coast than the western area. We think the difference of spatial pattern of deformation between the eastern and the western parts of Shikoku reflects difference in the scheme of plate subduction, and difference of the principal axes of strain around the focal region of the 2000 western Tottori earthquake before the occurrence from those in the surrounding region may have been related to a preparing process of the earthquake.