Simultaneous Estimation of Interplate Coupling and Block Rotation in SW Japan using GPS Data -Assessment of Reliability-

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In SW Japan, Philippine Sea plate (PHS) is subducting obliquely, Nankai/Tonankai Earthquakes have repeatedly occurred in the past, and seismicity pattern varies along arc. The Okinawa Trough is now rifting in the back-arc area of Nansei Islands. Thus the tectonic situation in SW Japan is fairly complex. The results from continuous GPS observation by GEONET operated by the Geographycal Survey Institute shows that the crustal deformation in SW Japan varies along the island arc very much: the deformation caused by PHS subduction is dominant in Chugoku and Shikoku region. The deformation pattern in Kyushu island looks divided roughly into three parts; Northern Kyushu (NK), Mid-Kyushu (MK) and Southern Kyushu (SK). MK is moving westward and SK is moving southeastward with reference to NK (Aoki & Kagiyama, [1]). A paleomagnetic study (Kodama, [2]) shows that SK including Tanegashima island rotated about 30 degrees anticlockwise in the last 6 Ma. Thus simultaneous modeling of block rotation and interplate coupling in SW Japan should be important to understand the tectonics of SW Japan.

In this region, Nishimura & Hashimoto[3] and Takayama & Yoshida[4] investigated block rotation and interplate coupling from off-Tokai to Hyuga-nada using models assuming many rectangular faults on plate and block boundaries. We have been studying on simultaneous estimation for block rotation parameters and coupling ratio on the plate and block boundary faults with realistic configuration using an inversion method devised by McCaffrey[5]. We will report on the assessment of reliability of the method through resolution test and estimation errors of parameters.

References:
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[2]*Chikyu*, 17, 411-413, 1995.
[3]*Tectonophys.*, 421, 187-207, 2006.
[4]*JGR*, 112, doi:10.1029/2006JB004690, 2007.
[5]in *Plate Boundary Zones*, Geodyn. Ser., 30, 100-122, 2002.