

## What can be deduced from three-dimensional GPS velocity field in plate convergent boundary region?

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We have conducted dense GPS campaign measurements in the Nankai subduction zone, southwest Japan since 1998. The measurements are carried out along a 200km-long line in a direction parallel to the convergence of the Philippine Sea plate (PHS), which runs from Cape Muroto to Chugoku Mountains across the Median Tectonic Line (MTL). The main purpose of this study is to clarify strain accumulation process in the plate convergence region and its relation to the activity of inland active faults. We have determined horizontal and vertical crustal velocities at 65 sites in total, including those at adjacent continuous stations of GSI. Moreover another measurement line has been deployed parallel to the first one since 2002, to better understand lateral variation of the deformation field.

Main results so far obtained are (1) horizontal velocities can be interpreted as compressive elastic deformation due to the oblique subduction of the PHS, (2) nearly full plate coupling is estimated at the Nankai Trough off Shikoku Island, (3) residual velocity field after the elastic deformation subtracted shows right-lateral block motion at about 5mm/yr across the MTL, (4) narrow zone of a high velocity gradient exists 20-30km north of the surface trace of the MTL as a block boundary, and (5) the residual velocity field can be reproduced by a model with a northward-dipping fault plane, full locking of the upper portion to a depth of 15km, and steady lateral slip below.

Vertical deformation field also implies compressive elastic deformation due to the PHS subduction with a strong coupling. The most characteristic is the subsidence of southeastern margin of Shikoku Island at about 6mm/yr. In contrast, mountainous region in central and northern Shikoku shows uplift of 2-4mm/yr. The subsidence-uplift pattern is consistent with the first-order leveling results but space coverage and time resolution have been greatly improved.

We will discuss the effect of the oblique PHS subduction on the lateral slip of the Nankai forearc and the relation between current crustal velocities and interplate great earthquake.