

## GPS Observation in the Pacific

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Geographical Survey Institute (GSI) deploys continuous GPS sites in the Pacific under Superplume project to determine the plate motion precisely and investigate the inner deformation. From the analysis of 2.5 years of data by Precise Point Positioning method in GIPSY/OASIS2, we found the movement of the Pacific plate is well described by the rigid plate motion, and it agrees better with the predicted value by the NNR-NUVEL1A plate motion model than previous results. We found no significant internal deformation.

Here, we plan to use GAMIT/GLOBK to analyze longer data period and by comparing with earlier results, get more reliable estimates of the motion of the plate and its rigidity.

The Geographical Survey Institute (GSI) deploys permanent GPS stations on Christmas, Midway, Tarawa, Rarotonga, Tongatapu, New Zealand and Gambier islands, covering the Pacific plate, to investigate the plate motion and intraplate deformation of the Pacific plate. With our deployment, number of stations in the Pacific plate are doubled and we hope to get more precise determination of the motion of the plate.

Our first result was obtained by GIPSY/OASIS2's Precise Point Positioning method. In that, station positions were estimated with fiducial free orbit. The solution was then transformed to the ITRF frame using the transformation parameters provided by the Jet Propulsion Laboratory. From the analysis of 2.5 years of data, we see that the estimated velocity field indicates the movement of the Pacific plate is well described by the rigid plate motion, and it agrees better with the predicted value by the NNR-NUVEL1A plate motion model than previous results such as Larson et al.,1997. We found no significant internal deformation, although the observing period is not long enough to detect the deformation as small as a few mm/yr.

In this paper, we plan to use GAMIT/GLOBK software and obtain a loosely constrained solution, which will be later combined with IGS network solution provided by the Scripps Institute of Oceanography. By comparing the two solutions, we would get reliable estimates of the velocity field and of the rigidity of the plate.

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