

## Monitoring of small short-term SSEs in southwest Japan based on GEONET data

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In south-western part of Japan, there occur episodic tremors and slips beneath Nankai trough(Obara 2010). These short-term slow slip events(S-SSEs) especially in Tokai region are known to be very small and hard to detect by GPS. Our study is a trial for monitoring these S-SSEs around south-west part of Japan, including Tokai region, by geodetic inversion method using GPS data.

The data used inversion was F3 solution for 15 years from 1996 to 2011 which were provided by Geospatial Information Authority of Japan (GSI) in south-west of Japan. The procedure is as follows :

1. Correction of offset in the GPS time series by earthquakes and antenna maintenance.
2. Principal component analysis(PCA) of the time series to remove the 1st principal component as common mode error between all the sites.
3. Taking differences between two 10 days-averages with 1 week interval, which is done for all the data with 1 day shift.
4. Adopting Bayesian inversion method proposed by Yabuki and Matsuura [1992] for above data.

Solving this inverse problem, we adopted a priori information which suppressed the slips on the fault surface without enough solvability. The slip axis was limited in the direction of the plate convergence of N45W but both polarities were allowed. In this study, we added two new conditions, one is that back slip rate must not exceed the convergence rate of Philippines sea plate, another that is the slip rate is zero in deeper position than 60km.

In our previous study, in which the two were not applied, we found unrealistic back and forward-slip in the deeper part where no coupling is expected because of the high temperature. We fixed the problem of the unrealistic slips by new conditions and then detectability of S-SSEs is better than that by the old method.

GPS is proved to be a good tool to monitoring very small inter-plate slip.

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