S169-012 **Room: 301B** **Time: May 26 11:37-11:50**

Generation cycles of short-term slow slip events in western Shikoku, southwest Japan

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Slow slip events (SSE) accompanied by deep low-frequency tremors have repeatedly occurred along the Nankai trough subduction zone in southwest Japan (Obara et al., 2004; Hirose and Obara, 2005, 2006). These recurrence intervals vary between three to six months, depending on a location in the tremor belt-like zone. Although the SSEs are thought to be a mode of slip behavior on the subducting plate interface of the Philippine Sea slab, the events are very beneficial because the recurrence of slip events including interplate earthquakes at the same place on a plate interface can rarely be observed. The identification of the slip behaviors of the SSEs over a number of cycles provides not only the direct information about the generation mechanism of the SSEs and tremors and the friction properties on the deep plate interface, but also the useful implications for understanding megathrust earthquake generation cycles at the shallower part on the interface. For these purposes, we tried to apply a time-dependent inversion method (Hirose et al., 2007) to the NIED Hi-net tiltmeter records in order to obtain detailed source processes of the SSEs.

We processed the tiltmeter data observed in western Shikoku, which include clear signals of several recurrence of the SSEs with a recurrence rate of about six months. The tilt records were decimated to have a sampling rate of one hour. The tidal components and the response to atmospheric pressure were subtracted with BAYTAP-G (Tamura et al., 1991). A linear trend in each trace was also subtracted. We then applied the time-dependent inversion method based on the Kalman filtering algorithm, assuming that the resultant tilt records can be expressed by the superposition of (1) the contribution from slow slip on the plate interface; (2) white noise; and (3) random-walk noise. We modeled the plate interface with placing a number of small square faults on the estimated plate configuration, and evaluated the contribution of a slip on the tilt changes with Okada's (1992) expression. The constraints applied to the inversion are the followings: (1) a slip direction is fixed to the direction of the relative plate convergence; (2) non-negative slip velocities; and (3) the smooth spatial distribution of slip velocity.

For each episode, the areas with larger slip were found at almost the same location of the tremor epicenters estimated with the envelope cross-correlation method (Obara, 2002). The propagation of slow slip area also corresponds to the migration of the tremors within about 10 km. This strongly suggests that both the SSE and tremors occur at the same location within a small volume of that size. Furthermore, the comparison of slip distributions for a number of slip episodes reveals that there is a patch with about 30 km wide where a larger slip occurs in most slip episodes.

In contrast to our analysis with the previous simpler method, where detailed slip distribution within a rectangular fault area has been unresolvable, the results of this study suggests that the SSEs do not occur homogeneously within the tremor belt-like zone, but are inhomogeneously distributed along the strike direction of the subducting slab. In other words, there are likely to be a couple of parts on the interface, one is a location where accumulated strain by a plate convergence has been released as a SSE, and at the other part, quasi-steady sliding is taking place.

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