

Fluctuation of the coupling rate along the transient zone in the Shikoku region

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In the southwestern part of Japan, interplate coupling due to the interaction between the subducting Philippine Sea plate and the overriding continental plate causes strain accumulation along the Suruga-Nankai trough. Because slow slip events (SSE) along the subduction zone such as in the Tokai region or in the Bungo Channel region release some of the accumulated strain, the spatiotemporal changes of the interplate coupling and SSE distribution are the direct information for the great earthquake in future. In the Shikoku region, the western part of the Suruga-Nankai trough, Ochi (2015, EPSL) showed a contrast in the strain accumulation process between the eastern and the western part of the region: the almost complete coupling consistently exists beneath the eastern part, while the accumulated strain was released at most about 30% by the repeating SSEs every several years in the western part, or in the Bungo Channel region. This result shows the Bungo Channel region also has a potential for being the rupture area in the future earthquake. Based on the work, we estimate the strain accumulation process along the belt-like transient zone to infer the lower limit of the rupture area. Using the daily coordinates of GNSS Earth Observation Network System (GEONET) in the southwestern part of Japan, the coupling rates along the zone is about 3 cm/yr with an fluctuation of 2-3 cm/yr in some part of the zone. An error of the estimated coupling rate is about 1 cm for the comparable spatial resolution of the GEONET site distribution (~20 km), this fluctuation can be treated as a significant change. We have already discussed the fluctuation only around the Bungo Channel region and the correlation with low frequency tremors (Ochi and Takeda, 2015, JpGU), and we will conduct the same discussion for the whole transient zone.

Keywords: SSE, interplate coupling, southwestern Japan