# Spatio-Temporal Variation of Interplate Quasi-Static Slip Before-and-After the M7-class Interplate Earthquakes in the Hyuga-nada, SW Japan

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The spatio-temporal variation of aseismic slip on the plate boundary of subduction zone is thought to be very important for understanding what controls the strength of interplate coupling and the earthquakes generation processes, which is necessary to progress the long- and mid-term earthquake forecast. The Hyuga-nada region in SW Japan, a high-angle subduction zone belong the Kyushu-Ryukyu arc, is one of the most seismically active area in the world and earthquakes with magnitude from 6.5 to 7.5 usually occur at dozens of years interval. So, Hyuga-nada region is one of the best fields for such studies because of moderate strength of interplate coupling. On the plate boundary, many small repeating earthquakes occur in the Hyuga-nada region. Small repeating earthquake is thought to be caused by the repeated rupture of a small asperity that is surrounded by the quasi-statically (aseismically) slipping area [e.g., Ellsworth (1995); Nadeau and McEvilly (1999); Igarashi *et al*. (2003); Uchida *et al*. (2003)]. Thus, the cumulative slip of small repeating earthquake coincides with the cumulative slip of quasi-static slip in the surrounding area. In other words, we can estimate the variation of quasi-static slip on the plate boundary around small asperity of small repeating earthquake from the cumulative slip history without geodetic method. In this study, we investigated the feature of the spatio-temporal variation of quasi-static slip on the plate boundary before-and-after the two *M* 7-class interplate earthquakes in the Hyuga-nada region using quasi-periodic occurrence of small repeating earthquakes detected by Yamashita *et al*. (2009). As a result, we found the acceleration of quasi-static slip before-and-after the *M* 7-class interplate earthquakes around its asperities. The acceleration of quasi-static slip started approximately a few month before the *M* 7-class events produces the stress concentration on these asperities, and has possibility of trigging the rupture of them. Large quasi-static slip after the events is recognized as the afterslip of the events, which shows the stress redistribution associated with the events.

Keywords: subduction zone; small repeating earthquake; spatio-temporal variation of quasi-static slip; stress concentration; stress redistribution.

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