

Long-term ocean bottom monitoring for slow earthquakes on the shallow plate interface in the Hyuga-nada region

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The Hyuga-nada region, nearby the western end of the Nankai trough in Japan, is one of the most active areas of shallow slow earthquakes in the world. Recently, ocean-bottom observation of offshore seismicity near the trench have succeeded to detect shallow tremor as a complete episode lasting for one month exhibiting similar migration property of deep tremor for the first time [Yamashita *et al.*, in revision]. This activity was also associated with shallow very-low-frequency earthquake (VLFE) activity documented by land-based broadband seismic network. The coincidence between tremor and VLFE and their migration pattern show strong resemblance with deep tremors during ETS episodes; this similarity suggests that the tremor activity in the shallow plate boundary may also be coupled with VLF and short-term slow slip events (SSEs) in this area. However, the shallow SSEs have not been detected to date, probably due to the lack of dense broadband seismic and/or geodetic observations in offshore. To clarify the relationship among these slow earthquakes is important to improve the assessments of the potential of tsunamigenic megathrust earthquake that is anticipated to occur at the Nankai Trough. Motivated by these issues, we started long-term ocean-bottom monitoring in this area from May 2014 using 3 broadband and 7 short-period seismometers. To detect the suspected shallow SSE, pressure gauges are mounted on the broadband ocean bottom seismometers for covering geodetic period range. In January 2015, we replaced the instruments and obtained the first data which includes minor shallow tremor and VLFE activity on June 1-3, 2014. Preliminary results of data analysis show that the shallow tremor activity occurred at the same area of the 2013 activity, but clear tremor migration has not been found yet. However, it is promising to detect the large short-term SSE with our dense and long-term observation including with pressure gauges in near future.

Keywords: shallow slow earthquake, Hyuga-nada, long-term ocean bottom monitoring