豊後水道スロースリップ断層面付近で発生した2つのスラブ内大地震による影響

Effect of two M6.6 in-slab earthquakes on occurrence of the next long-term slow slip event beneath Bungo channel

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It is important to consider the relationship of large in-slab earthquakes to the preparation of occurrence of slow slips and/or megathrust earthquakes on the plate boundary. Within the recent 25 years, there have been two in-slab earthquakes of magnitude over 6.5 in the Bungo channel (the 2024 M6.6 Bungo channel and the 2022 M6.6 Hyuga-nada earthquakes). We report temporary effects by the two in-slab earthquakes on the entire fault plane of the long-term slow slip events beneath Bungo channel. For both M6.6 events the plunges of Sigma 1 increase by 5-10 degrees after the events and rotate back to the state before the occurrence of these events beneath the fault plane of the long-term slow slip events. For both events plunges of Sigma 3 tend to decrease several degrees after the events, and the plunge for the 2024 event rotates back to the state before them. This may suggest that a temporary decrease of normal stress on the plate boundary and a following decrease of locking on the plate boundary just after the M6.6 events. The stress ratio R and plunge of the Sigma 1 in the period 1 month after the 2024 event are clearly changed. The plunge and azimuth of the Sigma 1 from 1 to 2.5 months after the 2024 event became close to the stress state during the long-term slow slips. The stress ratio R also continues to be ~0.7 before and after the large in-slab event. Based on the reoccurrence time (~7 years) and previous timing of the slow slip events, it is expected that the next long-term slow slip in Bungo channel will occur in ~2025. Our study methodology monitoring in-slab events may detect a signal of preparation of the next slow slip event.