Episodic tremor and slip silently invades strongly locked megathrust in the Nankai Trough

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Recent seismic and geodetic observations in subduction zones have revealed that slow earthquakes have preceded some large earthquakes (e.g., Kato et al., 2012; Mavrommatis et al., 2014; Ruiz et al., 2014). Characterization of slow earthquakes and their relation to large earthquakes provides important clues to constrain a wide spectrum of slip rates on tectonic faults. In this study, we report new evidence of a slow slip transient at the downdip edge of the strongly locked seismogenic zone in the western Nankai Trough in southwest Japan based on GNSS time series. This slow slip transient was remotely excited during an episodic tremor and slip at the downdip extension of the locked zone. Through this remote triggering, the frequent occurrence of the deep episodic tremor and slip invades the strongly locked megathrust zone and may intermittently increase the probability of large earthquakes in the Nankai Trough.

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