

## AOB Seminar

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開催日時: 2013 年 7 月 26 日(金) 10:30 - 12:00

場 所: 地震・噴火予知研究観測センター A 棟第二会議室

講演題目: Episodic slow slip events in subduction zones

- Physical mechanism and implications for megathrust earthquakes

Recent observations of episodic tremor and slip (ETS) events in worldwide subduction zones constitute a new mode of deformation at active plate boundaries. ETS consists of non-impulsive seismic radiation (“tremor”) with characteristic frequencies of 1-10 Hz, coupled with geodetically observed slow slip events (SSE) with durations of order weeks to years. The occurrence of ETS events poses significant questions as to their origin, and also relative to existing concepts of interseismic loading of the locked seismogenic regions. This talk will address the “slip” part of ETS. Using a numerical model of subduction fault governed by a rate- and state-dependent friction law, I will show that episodic SSEs arise spontaneously around the friction stability transition at the downdip end of the megathrust seismogenic zone. Modeled SSEs recur several months or years when the transitional depth is under near-lithostatic pore pressure, a condition supported by seismic imaging studies in northern Cascadia and southwest Japan margins. Modeled SSE source property scaling relations and synthetic GPS time series will be compared to observations in natural subduction zones. I will also discuss how fault gouge dilatancy, an effective strengthening mechanism under high pore pressure, affects the occurrence of SSEs and, more importantly, stabilizes downdip rupture propagation of megathrust earthquakes.