[EE] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG53]Science of slow earthquakes: Toward unified understandings of whole earthquake process

convener:Satoshi Ide(Department of Earth an Planetary Science, University of Tokyo), Hitoshi Hirose(Research Center for Urban Safety and Security, Kobe University), Kohtaro Ujiie(筑波大学生命環境系, 共同), Takahiro Hatano(Earthquake Research Institute, University of Tokyo)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Accumulating observational studies on various types of slow deformation events, such as tectonic tremors, very low frequency events, and slow slip events, portrays some universal characteristics in generally complex behavior, including interaction among events and influence by various outer loadings. Some of these phenomena seem to have causal relation with the occurrence of very large earthquakes. A unified understanding of these slow and fast earthquake processes requires an approach integrating geophysics, seismology, geodesy, geology, and non-equilibrium statistical physics. We welcome presentations based on, but not limited to, geophysical observation, data analysis, analytical theory, numerical simulation, field study, and laboratory experiments.

[SCG53-P02]Strength of tremor patches along deep transition zone of a megathrust

*Masayuki Kano[1,2], Aitaro Kato[2], Ryosuke Ando[3], Kazushige Obara[2] (1.Graduate school of science, Tohoku University, 2.ERI, The University of Tokyo, 3.EPS, The University of Tokyo)

Keywords:Slow earthquakes, Tremor, Western Shikoku

Deep low frequency tremors are indicators of slow slip transients in the brittle-ductile transition zone along subducting plates. Investigation of comprehensive tremor activities is therefore an important issue for understanding the seismic/aseismic characteristics in transition zones. Here, we focus on the radiated energy from tremors to reveal the along-strike heterogeneity in the strength of tremor patches. Based on a tremor catalog that more accurately evaluates radiated energy (Annoura et al. 2016), we examine the spatio-temporal activities of tremors accompanied by slow slip events in western Shikoku, southwestern Japan. The new findings of this analysis is that the energy radiation of tremor is positively correlated with the migration speed and slip velocity inferred from tilt records (Hirose and Obara, 2010). This can be qualitatively explained by a stress diffusion model (Ando et al., 2012) consisting of along-strike heterogeneities in the effective strength of tremor patches within a background ductile shear zone. This strength contrast is supported by a lateral variation in the stress drop; it is consistent with the fluid pressure distribution along the plate boundary fault (Nakajima and Hasegawa, 2016) and the tidal sensitivity of tremors (Ide, 2010). Accurate evaluation of tremor activities, especially the radiated energy, can be used to infer the spatial distribution of the strength of tremor patches in the worldwide transition zones.

Acknowledgments

We used a tremor catalog downloaded from ‘Slow Earthquake Database’ (Kano, Aso et al., 2017, AGU) (http://www-solid.eps.s.u-tokyo.ac.jp/~sloweq/), which is supported by JSPS KAKENHI JP16H06472. This research was supported by JSPS KAKENHI Grant Number JP16H06473 in Scientific Research on Innovative Areas “Science of Slow Earthquakes”.