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# Rupture propagation limited by on-fault diffusion

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We propose that the possible mechanism of slow earthquakes is a diffusion limited process realized by certain fault rheology with velocity hardening characteristics. However, the contribution of the diffusion will not be simple and we must understand how the diffusional processes appear in the observable features. In this talk, I will show a basic theory and discuss some observational facts based on this idea. In our model, developed in Ando et al [2010] and systematically analyzed in Nakata et al. [2010], source areas consist of unstable patches sparsely and heterogeneously distributed. The rupture speed is controlled by the density and sizes of the unstable patches and by the viscosity of the stable background area on the fault.

References

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Nakata, R., Ando, R., Hori, T. and Ide, S, Generation mechanism of slow earthquakes: Numerical analysis based on a dynamic model with brittle-ductile mixed fault heterogeneities, Journal of Geophysical Research, (submitted), 2010.

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