Friction laws for slow earthquakes and the spectrum of fault slip behaviors

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Over the past 20 years earthquake science has undergone a revolution in connection with the discoveries of seismic tremor and the widespread nature of low frequency, slow earthquakes. These phenomena represent modes of failure that were long thought to be non-existent and theoretically impossible. Anecdotal evidence for slow, quasi-dynamic faulting has existed for some time, but only recently have we been able to reproduce and carefully study these phenomena in the laboratory. Here, I summarize recent lab work on the spectrum of slip behaviors from fast to slow, with particular focus on results for repetitive, slow slip and their implications for friction constitutive laws that describe pressure sensitive and rate dependent rheology.