

Numerical simulation of seismic cycles with a composite rate- and state-dependent friction law

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Combining the slowness and slip laws, we develop a new rate- and state-dependent friction law, the composite law, which better fits experimental data than the existing laws for a wider range of conditions. We apply the composite law to modeling seismic cycles at the Suruga trough, where a large interplate earthquake is expected to occur. The recurrence interval of large earthquakes is the longest and the coseismic slip amplitude is the largest for the composite law. The amplitudes of preseismic sliding in the cases of the slip law and the composite law are almost the same and significantly smaller than that in the slowness law.