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Modeling aftershock sequences on a heterogeneous fault

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We show that realistic aftershock sequences with space-time characteristics compatible with observations are generated by a model consisting of brittle fault segments separated by creeping zones. The dynamics of the brittle regions is governed by static/kinetic friction, 3D elastic stress transfer and small creep deformation. The creeping parts are characterized by high ongoing creep velocities. These regions store stress during earthquake failures and then release it in the interseismic periods. The resulting postseismic deformation leads to aftershock sequences following the modified Omori law. The ratio of creep coefficients in the brittle and creeping sections determines the duration of the postseismic transients and the exponent p of the modified Omori law.