



Patterns of slip and stress signals on faults with slip-dependent friction

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Interrelations between slips, slip rates, and shear stresses, measured at different points along a fault plane during all stages of consecutive earthquake cycles, are investigated. The simulated patterns of these signals depend on the assumed distributions of strengths and critical slip distances. Moreover, the patterns observed at a given point change from one event to another, even if the fault structure remains unchanged. Details of the slip and stress patterns during earthquake initiation phase and between multiple events are studied in the context of earthquake prediction. Dependence of such macroscopic earthquake parameters as seismic energy, apparent stress, and seismic moment, on patterns of local slip rates, leads to statistical scaling between different earthquake size measures.