

SELF-SIMILAR PHASE DYNAMICS OF BOUNDARY FRICTION

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S u m m a r y

The melting of an ultrathin lubricant film confined between two atomically flat solid surfaces has been studied. The phase diagram with the domains of sliding, dry, and intermittent (stick-slip) frictions has been constructed, by taking the additive noises of stress, strain, and temperature into account. The time series of stresses have been constructed for the parameters of all the modes within the Stratonovich calculus. In the case where the temperature noise intensity exceeds much more the intensities of stress and strain noises, the self-similar mode is established during the melting of a lubricant. The multifractality of the stress time series is shown to be provided by the power-law shape of the distribution function and by the presence of correlations in the system.