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Mapping spatial persistent large deviations of nonequilibrium surface growth processes onto the temporal persistent large deviations of stochastic random walk processes[1] MAGDALENA CONSTANTIN, SANKAR DAS SARMA, University of Maryland, Condensed Matter Theory Center — Spatial persistent large deviations probability of surface growth processes governed by the Edwards-Wilkinson dynamics, $P_x(x,s)$, with $-1 \leq s \leq 1$ is mapped isomorphically onto the temporal persistent large deviations probability $P_t(t,s)$ associated with the stochastic Markovian random walk problem. We show using numerical simulations that the infinite family of spatial persistent large deviations exponents $\theta_x(s)$ characterizing the power law decay of $P_x(x,s)$ agrees, as predicted on theoretical grounds by Majumdar and Bray [Phys. Rev. Lett. **86**, 3700 (2001)] with the numerical measurements of $\theta_t(s)$, the continuous family of exponents characterizing the long time power law behavior of $P_t(t,s)$. We also discuss the simulations of the spatial persistence probability corresponding to a discrete model in the Mullins-Herring universality class, where our discrete simulations do not agree well with the theoretical predictions perhaps because of the severe finite-size corrections which are known to strongly inhibit the manifestation of the asymptotic continuum behavior in discrete models involving large values of the dynamical exponent and the associated extremely slow convergence to the asymptotic regime.

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Magdalena Constantin
University of Maryland, Condensed Matter Theory Center

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