Survival Probability in the Fluctuations of Interacting Steps

HAILU GEBREMARIAM, U. of Maryland, College Park (UM), C. DASGUPTA, Indian Inst. of Science–Bangalore & UM, T.L. EINSTEIN, UM — We have performed Monte Carlo studies of survival probabilities $S(t)$ and autocorrelation functions $C(t)$ [1] of interacting steps on vicinal surfaces within the terrace-step-kink (TSK) model. Using Langevin formalism, the analytical and numerical investigations in [1] assumed a step fluctuates in a harmonic confining potential, reminiscent of the Gruber-Mullins model. However, the interaction between steps separated by $\ell$ has the form $A/\ell^2$. Adapting the program written to study distribution of $\ell$ [2], we investigate how $A/\ell^2$ repulsions alter the relation between long-time behaviors of $S(t)$ and $C(t)$ established in [1]. The ratio of their respective characteristic times decreases as $A$ increases. We also investigate the scaling behavior of $S(t)$ vs. system size and sampling time.


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