Abstract Submitted
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Molecular motors driven by asymmetric nucleation AMIT LAKHANPAL, TOM CHOU, UCLA — We study a one dimensional model of asymmetric nucleation where the phase boundaries are coupled to a load particle. Sites on the one-dimensional lattice are either empty or filled. Empty sites get filled faster if the is a filled site immediately preceding it. This model has applicability to nucleation problems where the substrate is directional. Examples include nucleation of proteins on filamentary substrates such as nucleic acids and microtubules. The hydrolysis of ATP or GTP in microfilaments such as RecA has been proposed as a mechanism of moving Halliday junctions, and can also be described qualitatively by our model. Using Monte Carlo simulations, we find mean velocities and of a load particle as function of the nucleation rates and the asymmetry parameter. Our results are compared with simple mean field approximations.

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