Abstract Submitted
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Simulation of Actin-Polymerization-Mediated Propulsion[1] KUN-CHUN LEE, ANDREA LIU, University of Pennsylvania, Department of Physics and Astronomy — An important component of the cellular cytoskeleton is F-actin, a biopolymer whose self-assembly is key to the process of cell crawling. The polymerization and branching of F-actin near the cell membrane is known to drive cell crawling, but the precise mechanism by which these processes lead to the generation of a mechanical force is still controversial. We have constructed a Brownian dynamics simulation of F-actin polymerizing near a surface, which includes all known important processes, including polymerization, depolymerization, branching, severing and capping. Using this model, we are able to simulate the cell movement. We measure the speed as function of concentration of different proteins involved in the process. We find the speed to be non-monotonic, consistent with experimental results [Louis et al. Nature **401** 613 (1999)].

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