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Simulation of Actin-Polymerization-Mediated Propulsion KUN-CHUN LEE, Department of Chemistry and Biochemistry, UCLA, ANDREA LIU, Department of Physics and Astronomy, University of Pennsylvania — 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, crosslinking and capping. Using this model, we study the dynamics of the moving surface in conjunction with the stresses in the system.

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