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Colloidal dynamics near an interface MADHAV MANI, Harvard University & KITP, UCSB, VINOTHAN MANOHARAN, MICHAEL BRENNER, DAVID KAZ, RYAN MCGORTY, Harvard University — Although the equilibrium state of a colloidal particle at an interface is well understood, the dynamics associated with the approach to equilibrium is not. Recent high-resolution experiments have shown that the dynamics are richer than expected. This part of the study focuses on the evolution of the system after the initiation of a contact-line. We model the dynamics associated with the three degrees of motion in this regime, the center of mass (c.o.m.) of the colloid, the location of the contact-line and the dynamic contact-angle. Following Nikolov et al. (Journal of Colloid and Interface Science - 112,1,1986), we derive the statements of force balance by taking variations of an energy functional. Appealing to a balance of power we are able to derive the dynamical laws. Associated with the degrees of motion are three modes of dissipation corresponding to a moving c.o.m., a moving contact-line and an evolving contact angle. We derive an asymptotically valid model for the system, which we integrate numerically and compare to experiments.

Madhav Mani
Harvard University & KITP, UCSB

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