

Abstract Submitted
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Field-driven pattern formation of charged particles in nonpolar solvent TINA LIN, SHMUEL RUBINSTEIN, DAVID WEITZ, Harvard University — We combine microfluidics and high-speed imaging to investigate transport dynamics of charged colloidal particles in a nonpolar solvent as the polarity of an external electric field is switched periodically. Immediately following a switch, particles which were initially all packed against one electrode move towards the opposite electrode in an unstable manner; instead of remaining uniform, the particle front develops undulations. This results in a heterogeneous deposition of particles on the electrode wall. For a range of wait times between switches, we find that the particles localize at exceptionally well-defined periodic modes and we offer a simple physical model to account for this pattern formation.

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