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**Nonlinear electrophoresis in nematics: Flows and effects of salts**

ISRAEL LAZO-MARTINEZ, OLEG D. LAVRENTOVICH, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University — Electrophoresis (EP) in a nematic liquid crystal (LC) is dramatically different from its isotropic counterpart, as the EP velocity has a component that is quadratic in the applied electric field [1]. Unlike the regular EP velocity that is linear in the field, this component does not vanish in an ac field with a zero time average, which makes the LC EP attractive for applications where the steady flows are needed. EP propulsion is caused by distortion of the LC orientation around the particles that break the fore-aft (or left-right) symmetry, leading towards an imbalance of field-induced flows around the particles. We visualize the flows and measure the EP velocity by recording 3D trajectories of passive tracers suspended in the LC under the fluorescent confocal polarizing microscope. We demonstrate that doping the LC with organic salts increases the EP velocities. The work was supported by NSF DMR 0906751.

[1] O. D. Lavrentovich, I. Lazo, O. P. Pishnyak, *Nature* 467, 947-950 (2010).

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