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Computer Simulation of Colloidal Electrophoresis[1] BURKHARD DUENWEG, VLADIMIR LOBASKIN, KRISHNAN SEETHALAKSHMY-HARIHARAN, CHRISTIAN HOLM, Max Planck Institute for Polymer Research, Mainz — We study the motion of a charged colloidal sphere surrounded by solvent, counterions, and salt ions, under the influence of an external electric field. The ions are modeled as particles which interact dissipatively with a lattice Boltzmann background, such that hydrodynamic interactions are taken into account. Similarly, the colloid is modeled as a spherical array of such point particles. Finite concentration values are taken into account by simulating the system in a box with periodic boundary conditions. In terms of dimensionless reduced parameters, the results compare favorably with experimental data. As a complementary approach, we solve the electrokinetic equations by a finite element method.

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