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Electrokinetic interaction between a charged cylindrical particle and a charged planer surface¹ DOLFRED VIJAY FERNANDES, SANGMO KANG, YONG KWEON SUH², Department of Mechanical Engineering, Dong-A university, Busan, 604714 — Electrophoretic motion of a charged particle under an electric field applied parallel to the planer surface has been studied numerically. Effect of electric double layer (EDL) interaction between the particle and the surface on the electrophoretic motion is the main focus of the study. Thick EDL around the particle and on the surface is obtained by solving Poisson-Nernst-Planck (PNP) equations on a hybrid grid system. A Lagrange type cylindrical grid attached to the particle can move freely on Euler type Cartesian grid. Second order accurate bilinear-interpolation scheme is used at the intersection of Lagrange-Euler grid. The linear and rotational motion of particle in the electroosmotically driven fluid is obtain by balancing EDL interaction force, gravitational force, electrostatic force and hydrodynamic force. The fluid flow along the surface and around the particle is computed by solving Stokes equations.

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