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Colloidal Trapping within a Second Kind Electroosmotic Vortex Pair at a Microchamber-Nanoslot Interface YOAV GREEN, GILAD YOSSIFON, Technion - Israel Institute of Technology — It has been shown in previous works that due to strong tangential electric fields, electroosmotic vortices of the second kind appear at the interface of a microchamber-narrow nanoslot. Continuity of fluxes causes strong field focusing effects which change the characteristic behavior of the current-voltage curve and traps particles, larger than the nanoslot height, at the nanoslot interface. We solve the steady state Poisson-Nernst-Planck-Stokes equations for a 2D model of a microchamber-narrow nanoslot interface. Afterwards, the particle's dynamic equations of motion including a non-divergence free dielectrophoresis (DEP) force are solved to obtain the particle trajectories. It is demonstrated that due to the short range DEP force particles in the vicinity of the interface are quickly trapped which stands in qualitative agreement with the experimental findings.

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