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Two-Stage Particle Trapping by Aggregation and DEP Reversal in Micro-Vortices ZACHARY GAGNON, University of Notre Dame, Department of Chemical and Biomolecular Engineering — We report a new negative DEP trapping mechanism to induce migration of small particles into electrode gaps. A high frequency AC voltage is applied to a serpentine wire above an aqueous dilute suspension of micron size particles to produce strong electro-osmotic vortex flows. Such flows convect particles from the bulk suspension to the high field regions of the serpentine wire but the particles are suspended away from the wire due to a balance between positive DEP and buoyancy forces. The suspended particles aggregate within the vortex due to induced-dipole interaction. The larger aggregates have a lower DEP crossover frequency and suffer a negative DEP force in an electrolyte whose permittivity is properly tuned with zwitter ions. The aggregates then migrate from the vortex and are trapped in the low-field gap region.

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