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Determination of colloidal particle surface charge from dielectrophoresis MARKO CHAVEZ, RITTIRONG NUANSRI, JACOB MAZZA, H. DANIEL OU-YANG, Lehigh University — Electrophoresis (EP) is used to determine colloidal particle surface charge. However, when the Debye length is comparable to or larger than the particle size, electrophoresis cannot be reliably used to determine the surface charge due to counter ion retardation flow. Alexander et al. developed a theory relating colloidal osmotic pressure and particle surface charge. We use dielectrophoresis (DEP) to obtain a potential landscape based on the number density distribution of the particles in a non-uniform AC electric field. We determine the osmotic pressure from the DEP force and density profiles using Einstein's osmotic equilibrium equation. Surface charge obtained by DEP (thermodynamics) will be compared to that obtained by EP (electrokinetics).

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