On Determination of the Equation of State of Colloidal Suspensions[1] KRITTANON SIRORATTANAKUL, Department of Physics, Lehigh University, HAO HUANG, Department of Chemical and Biomecular Engineering, Lehigh University, CHRISTOPHER UHL, Bioengineering Program, Lehigh University, DANIEL OU-YANG, Department of Physics, Lehigh University — Colloidal suspensions are the main ingredients for a variety of materials in our daily life, e.g., milk, salad dressing, skin lotions and paint for wall coatings. Material properties of these systems require an understanding of the equation of state of these materials. Our project aims to experimentally determine the equation of state of colloidal suspensions by microfluidics, dielectrophoresis (DEP) and optical imaging. We use fluorescent polystyrene latexes as a model system for this study. Placing semi-permeable membranes between microfluidics channels, which made from PDMS, we control the particle concentration and ionic strengths of the suspension. We use osmotic equilibrium equation to analyze the particle concentration distribution in a potential force field created by DEP. We use confocal optical imaging to measure the spatial distribution of the particle concentration. We compare the results of our experimental study with data obtained by computer simulation of osmotic equilibrium of interacting colloids.

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