

Graduate Student Research Seminar

Fall 2021

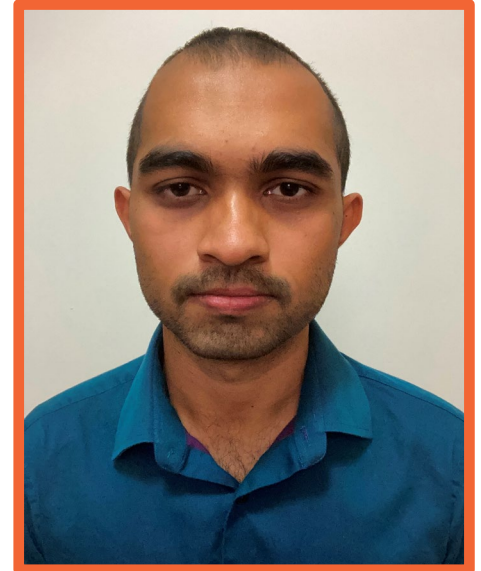
Fluid elasticity enhanced insulator-based dielectrophoretic focusing of particles in a constriction microchannel

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Advisor: Dr. Xiangchun Xuan

Monday, September 20th

3:00 pm (EST) – 132 Fluor Daniel Building



Abstract

Focusing particles and cells into a tight stream is often an important step prior to detecting, analyzing and sorting them. We demonstrate the addition of a small amount of polyethylene oxide (PEO) polymer into a buffer solution can significantly enhance the insulator-based dielectrophoretic (iDEP) focusing of particles in a constriction microchannel. We attribute this enhancement to the viscoelasticity of the PEO solution that may affect both the electrokinetic and dielectrophoretic particle motions. We study the parametric effects of polymer concentration, polymer molecular weight, particle size, and particle type on the iDEP focusing under pure DC electric fields. The required focusing voltage in this method was found to be one order of magnitude smaller than in the buffer solution which can be crucial while working with cells/biological samples to ensure retained viability.



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