

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Diamagnetic Particle Separation in Ferrofluid Microflows XI-ANGCHUN XUAN, LITAO LIANG, Clemson University — Particle separation is important for a wide range of applications. A variety of force fields have been demonstrated to separate particles in microfluidic devices. Magnetic field-induced separation is simple, cheap, and free of fluid heating issues that accompany electric, acoustic, and optical methods. We develop a novel magnetic particle separation method in a curved microchannel with a nearby permanent magnet. This method is capable of separating both magnetic and nonmagnetic particles by size. It is based on the dependence of particle magnetophoresis on the particle size and the particle's distance from the magnet. We present in this talk a continuous separation of 3 μm - and 5 μm -diameter polystyrene particles in a ferrofluid flow without magnetic and fluorescent labeling. We also develop a numerical model to simulate the particle separation process.

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Date submitted: 26 Jul 2011

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