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**Diamagnetic Particle Deflection in Ferrofluid Flows through a Rectangular Microchannel** LITAO LIANG, XIANGCHUN XUAN, Clemson University — Magnetic field-induced particle manipulation is a promising technique for biomicrofluidics applications and offers several advantages over other traditional approaches based on electric, acoustic and optical forces. We present in this talk a fundamental study of diamagnetic particle motion in ferrofluid flows through a rectangular microchannel with a nearby permanent magnet. Due to their negligible magnetization relative to the ferrofluid, diamagnetic particles experience negative magnetophoresis and are repelled away from the magnet. The result is a three-dimensionally focused particle stream flowing near the bottom outer corner of the microchannel. The effects of particle size and position, ferrofluid flow rate and concentration, and magnet-channel distance on the diamagnetic particle deflection are systematically studied. The obtained experimental results agree reasonably with the predictions of a developed three-dimensional analytical model.

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