Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Ferrofluid-based Diamagnetic Particle Separation in U-shaped Microchannels.[1] YILONG ZHOU, XIANGCHUN XUAN, Clemson University — We demonstrate in this talk a continuous-flow sheath-free separation method of diamagnetic particles in ferrofluids through U-shaped microchannels. Due to the action of a size-dependent magnetic force, diamagnetic particles are focused into a single stream in the inlet branch of the U-turn and then continuously separated into two streams in its outlet branch. We also develop a 3D numerical model to predict and understand the diamagnetic particle transport during the separation process. The numerical predictions are found to agree well with the experimental observations in a systematic study of multiple parameter effects including ferrofluid flow rate, concentration and magnet-channel distance.

[1]This work was supported by NSF.

Xiangchun Xuan
Clemson University

Date submitted: 03 Nov 2015 Electronic form version 1.4