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Surfactant effects on microfluidic contraction and expansion flows. MICHAEL DACUS, Clemson Univ, SEAN HEKKER, MAHMUD RAIHAN, XIANGCHUN XUAN, Clemson University — Sorting particles is critical in many applications such as environment monitoring, food safety, and water quality control. Over the past decade, there has been a rapidly growing interest in the use of flow-induced lift forces to focus and separate particles in both Newtonian and non-Newtonian fluids through microchannels. Surfactants like tween 20 are often mixed into the particle suspensions to minimize particle aggregation and adhesion issues. It is, however, unknown if the addition of surfactants has an impact on the fluid and particle motions. We present in this talk an experimental study of the flow of deionized water and shear-thinning xanthan gum solution through a planar expansion-contraction microchannel. The flow pattern is visualized via the use of small tracing particles seeded in each solution both with and without the surfactant. The comparison of the vortex development is performed in a similar wide range of flow rates.

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