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Colloidal band assembly in different microchannels[1] MINAMI YODA, ANDREW YEE, Georgia Institute of Technology, VARUN LOCHAB, SHAURYA PRAKASH, The Ohio State University — Over the last few years, we have shown that polystyrene colloidal particles in a dilute suspension flowing through a microchannel assemble into near-wall bands in combined steady Poiseuille and electroosmotic (EO) "counterflow" driven by a pressure gradient and dc electric field, respectively, in opposite directions. The bands of concentrated particles have a cross-sectional dimension of a few μm and an axial extent of $O(1$ cm) and a cross-stream spacing of $O(10\ \mu$m). This type of colloidal assembly has been demonstrated for a variety of particle radii, zeta-potentials, and concentrations, and the flow characteristics required for band assembly, as well as the characteristics of the bands once formed, depend strongly upon these suspension and particle properties. More recently, we have started investigating how band assembly is affected by channel properties. Results are presented at different streamwise (x) locations in different channel geometries for fused-silica and polydimethyl siloxane(PDMS)-fused silica channels with their different wall zeta-potentials ζ_{W} . The effect of suspending liquid properties including electrolyte composition and ionic strength is also discussed.

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