Abstract Submitted
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**Colloidal particle dynamics during the particle accumulation stage**[1] ANDREW YEE, MINAMI YODA, Georgia Inst. of Tech. — Colloidal polystyrene particles in a very dilute (volume fractions = $O(10^{-5}$–$10^{-3})$ suspension become attracted to, and accumulate in, the high shear regions near the wall, depleting particles from the bulk, in combined Poiseuille and electroosmotic "counterflow." This has been observed in $H = 34$ $\mu$m deep channels when the pressure and voltage gradients are in the same direction. The particles then assemble into streamwise structures that we call "bands". Two-color experiments, where 1% of the $a \approx 250$ nm radius particles are tracers labeled with a different fluorophore, are used to investigate the initial particle accumulation stage at different streamwise locations. The near-wall particle concentration increases linearly over time by at least two orders of magnitude, consistent with the exponential growth in the average image grayscales reported previously. These results are used to estimate the wall-normal attractive "lift" forces that drive particle concentration, and compared to recent models. There appears to be an "entrance length", where the near-wall particle concentration does not become independent of streamwise position until $O(10^3 H)$ downstream of the inlet, which may depend on the number of suspended particles upstream.

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