

Abstract Submitted  
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**Particle-induced miscible fingering** RUI LUO, YUN CHEN, SUNGYON LEE, University of Minnesota Twin Cities — We experimentally inject silicone oil into the mixture of oil and non-colloidal particles inside a Hele-Shaw cell, to investigate the connection between miscible fingering and the flow structure that develops in the thin gap. Previous studies with pure fluids have demonstrated that the onset of miscible fingering coincides with the transition from a smooth tongue-like structure to a sharp front between invading and defending fluids inside the thin gap. Our current experiments with suspensions reveal the same general behavior at the onset of miscible fingering, which we capture qualitatively using a continuum model. However, beyond the onset, we observe distinctly different morphologies of miscible fingering, which depend on the ratio of the gap thickness to particle diameter. We present the new quantitative measurements that highlight these differences and discuss how the wall confinement may alter the particle dynamics and the resultant fingering patterns.

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