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Formation and destabilization of the particle band on the fluid-fluid interface JUNGCHUL KIM, FENG XU, SUNGYON LEE, Texas A&M University — An inclusion of spherical particles in a viscous fluid can fundamentally change the interfacial dynamics and even cause interfacial instabilities. For instance, particle-induced viscous fingering has been previously observed even in the absence of the destabilizing viscosity ratio, when particles are added to the viscous invading fluid inside a Hele-Shaw cell. In the same flow configuration, the effects of channel confinement lead to the appearance of a novel fingering regime which consists of the formation and break-up of a dense particle band on the interface. In this talk, we experimentally characterize the evolution of the fluid-fluid interface in this new physical regime and propose a simple model of the particle band that successfully captures the onset of fingering as a function of the particle concentrations and particle size.

Sungyon Lee
Texas A&M University

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