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An experimental investigation of the settling and resuspension of gravity-driven, mono- and bi-disperse slurries GILBERTO URDANETA, UCLA, MATT HIN, Cornell University, KAIWEN HUANG, UCLA, SHREYAS KUMAR, Harvey Mudd College, ALIKI MAVROMOUSTAKI, JEFFREY WONG, UCLA, SUNGYON LEE, Texas A&M, ANDREA BERTOZZI, UCLA — We investigate the dynamics of gravity-driven mono- and bidisperse suspensions consisting of silicone oil and negatively buoyant particles of different densities experimentally. The well-mixed slurry mixtures spread down an inclined plane, exhibiting distinct flow patterns arising from competition of gravitational sedimentation and varying shear forces. We confirm the results of previous studies where, an initially well-mixed flow evolves towards either a "settled" regime in which the particles settle to the substrate, or a "ridged" regime in which the particles aggregate at the front of the flow. Our results show that the addition of a second particlespecies induces or prevents the setting of particles due to the mismatch in particle densities. We show that the latter depends strongly on the relativeamountof heavy to light particles used. We compare our experimental results to spreading relations as applied to particle-free, thin-fluid films. Further,we investigate the evolution of particle concentrations in each of the two regimes by using fluorescent particle beads and compare our results toexistingtheoretical models.

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