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Particle Accumulation At An Advancing Interface In Dense Suspension Flow TIMOTHY SINGLER, SUNY Binghamton, JOHN MOLYNEUX, Villanova University — It is well known that the volume fraction of particles adjacent to a meniscus formed by a dense suspension in contact with another immiscible fluid increases if the meniscus is advancing and decreases if the meniscus is receding. Particle accumulation at an advancing interface has been observed in tubes and narrow-gap flows and has been suggested to induce an instability in the latter case. Only ad hoc explanations of the accumulation phenomenon have been offered. We analyze the flow of a dense suspension in the gap of a rectangular Hele Shaw cell with a simple model of the advancing interface and solve the 2-D phenomenological equations for the suspension that provide for hydrodynamic diffusion of the particles. The equation set is solved using a finite volume methodology. The flow domain is a two dimensional rectangle with prescribed inflow and concentration at the base. The upper boundary, representing a free surface with an essentially inviscid fluid, is modeled for simplicity as a rigid free-slip lid that moves so as to maintain mass conservation. The results from this simple computational model will be compared with experiment.

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