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Development of wall layering in non-homogenous suspension shear flows AMANDA HOWARD, MARTIN MAXEY, Brown University — Fully developed homogeneous suspensions of particles in a pressure driven flow show a net increase in particle volume fraction in the center of the channel, representing a densely packed core region, as well as particle layering along the channel walls. Using numerical simulations, we examine the early development of the wall layers in a suspension of neutrally buoyant, non-Brownian particles in steady and unsteady low Reynolds number flows. Because of the no-slip boundary condition, the particles have no tangential velocity at the wall, but can roll in the streamwise direction. When the particle roughness is monodispersed the particles form a layer a uniform distance from the channel wall. Using a bidispersed particle roughness breaks up the coherence of the wall layer resulting in a greater exchange of particles between the wall and the core region. We will report on a series of simulations varying the particle roughness and sizes to examine the development of the wall layer and near-wall particle fluxes.

Amanda Howard
Brown University

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