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Dynamics of bidensity suspensions in gravity-driven thin film flows JEFFREY WONG, ANDREA BERTOZZI, Univ of California - Los Angeles — We study bidensity suspensions of a viscous fluid on an incline, where the particles migrate due to a combination of gravity-induced settling and shear induced migration. The physical problem is modeled by a hyperbolic system of conservation laws for the height and particle concentrations. We consider the constant flux problem and show that the system exhibits three-shock solutions corresponding to distinct fronts of particles and liquid traveling at different speeds, as well as singular shock solutions for sufficiently large concentrations, for which the mechanism predicted by the model is similar the single-species case. We also consider initial conditions corresponding to a finite reservoir of fluid, where solutions are rarefaction-shock pairs, and compare to experiments.

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