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Particle-laden thin film flow with surface tension LI WANG, ALIKI MAVROMOUSTAKI , ANDREA BERTOZZI, Department of Math, University of California, Los Angeles — We derive a dynamic model which describes the evolution of a thin film, laden with negatively buoyant particles on an incline including the surface tension effect. The original model (Murisic et. al [J. Fluid Mech. 2013]) that only considers the leading order effects such as gravity and shear induced migration can produce singular shock when the particle concentration is above a critical value. Our model builds on a similar equilibrium theory and results in a 2×2 system of conservation laws augmented with forth order diffusion. Such diffusion is both a stand-alone regularization and a modification of the original flux, thus posing challenges for both the design of numerical schemes and analysis. We present the model and a proposed numerical method that produces solutions in which the singularity is suppressed, leading to more physical solutions.

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