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Nonnegative weak solutions for a degenerate system modeling the spreading of surfactant on thin films

Depending on the parameter range, we prove local and global in time existence of non-negative weak solutions to a coupled system of two degenerate parabolic equations. This system models the spreading of an insoluble surfactant on a thin liquid film. The model includes gravity, surface tension, capillarity effects, and van der Waals forces. The surface diffusion coefficient is not assumed constant and depends on the surfactant concentration.

Joint work with: Roman M. Taranets, UCLA