

Abstract Submitted  
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**Effect of insoluble surfactant on the evolution of electrified falling films** B. UMA, University of Pennsylvania, R. USHA, Indian Institute of Technology Madras — Nonlinear stability of a thin liquid film down an inclined plane when the film surface is contaminated with an insoluble surfactant and the film is subjected to an electric field has been analyzed. The evolution equation of the electrified contaminated film has been derived using long-wave perturbations. Linear stability analysis of the electrified contaminated film reveals that the effect of electric Weber number and Marangoni number is to destabilize the film flow system. The nonlinear evolution of the film thickness is found by numerically solving the coupled nonlinear evolution equation for the film thickness and the surfactant concentration in a periodic domain. Evolution profiles of the thin film thickness and the surfactant concentration down an inclined plane are plotted for the different values of parameter governing the flow.

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