

Abstract Submitted
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On dimpled thin liquid falling films H. GRANDJEAN, Ecole Polytechnique, B.S. TILLEY, Franklin W. Olin College of Engineering, A.E. HOSOI, Dept. Mechanical Engineering, MIT, L. KONDIC, Center for Applied Mathematics and Statistics, NJIT — The interfacial dynamics of a thin liquid falling film flowing on a plane inclined with respect to gravity is investigated. The glycerol-water mixture is recirculated through the experiment, and after a significant time, isotropic, transient depressions along the fluid surface appear and disappear. The locations of these events, which we call “dimples” are shown to be independent of spatial location, and are more pronounced as the average film thickness is reduced. Potential mechanisms for this transient behavior could involve large Peclet-number dynamics of soluble surfactant, Marangoni and inertial fluid effects and shear-induced migration of particles within the bulk. Comparison of the theory to the experiment is presented.

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