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Numerical Simulation of 3D Thin Metallic Liquid Film Dynamics.

In the paper by Atena & Khenner, the lubrication-type dynamical model of a molten, pulsed-laser-irradiated metallic film was developed. The heat transfer problem that incorporates the absorbed heat from a single beam or interfering beams is solved analytically. Using this temperature field, the three-dimensional long-wave evolution partial differential equation for the film height was derived. To get insights into dynamics of dewetting, we studied the two dimensional (2D) version of the evolution equation by means of a linear stability analysis and by numerical simulations. In this study we extend our work to study the three-dimensional (3D) version of the evolution of the height of a thin metallic liquid film by numerical simulations. (Received September 14, 2014)