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**Deformation of a Thin Film by a Wall Jet** NAIMA HAMMOUD, TALAL AL-HOUSSEINY, HOWARD STONE, Princeton University, Princeton, NJ — A variety of industrial processes such as jet stripping or jet wiping involve a high speed stream of gas flowing over a liquid film. In this work, we model this kind of situation by considering a thin viscous liquid film, over which a high Reynolds number laminar wall jet (or Glauert jet) is flowing. We study the shape of the thin liquid film, which is deformed due to the shear stress induced by a jet of a low-viscosity fluid. The mechanics of the jet, which is modeled by boundary-layer theory, is coupled to the mechanics of the thin film, which includes the influence of surface tension and buoyancy. We describe the unsteady shape of the film using the lubrication description to derive a nonlinear PDE that is coupled to the Glauert jet via interfacial stresses. For the steady state, we obtain analytical solutions in different asymptotic regimes. We compare our theoretical findings to numerical simulations conducted with the finite volume solver FLUENT.

Naima Hammoud
Princeton University, Princeton, NJ

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