

Abstract Submitted
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Rupture of thin liquid films with Plateau borders¹ LUCIEN BRUSH, ALAN MCINTYRE, University of Washington, STEVEN ROPER, University of Glasgow — In metal foams there is fluid flow from a lamella into the Plateau borders resulting in lamellar thinning. Since surfactants are not used to slow the flow, instability of a lamella quickly leads to rupture, bubble coalescence and overall coarsening of the foam. This talk presents the results of numerical calculations of the rupture process of a lamellar film with Plateau borders in a gas-liquid metallic foam. The numerical calculations show the evolution of a lamella from the initiation of an instability up to the time just prior to rupture. Rupture times and locations are monitored as a function of the Plateau border radius of curvature. The effect of symmetry-breaking configurations in which a lamella spans two Plateau borders having different radii of curvature shows that the location of rupture can be near the thin film - Plateau border junction. Solutions at late times are compared to the similarity solutions for the case of free films without Plateau borders.

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