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The Effect of Dynamic Wetting on the Stability of a Gas-Liquid Interface Subjected to Vertical Oscillations ANDREW M. KRAYNIK, LOUIS ROMERO, JOHN R. TORCZYNSKI, CARLTON F. BROOKS, TIMOTHY J. O'HERN, RICHARD A. JEPSON, GILBERT L. BENAVIDES, Sandia National Laboratories — The stability of an interface in a container partially filled with silicone oil and subjected to gravity and vertical oscillations has been examined theoretically and computationally. An exact theory for the onset of a parametric instability producing Faraday-like waves was developed for arbitrary liquid viscosity, stress-free walls, and deep two-dimensional or axisymmetric containers. Finite-element simulations for stress-free walls are in excellent agreement with the theory, which predicts instability in discrete frequency bands. These simpler calculations are a departure point for examining the more realistic problem, which involves no-slip at the walls and dynamic wetting modeled with a Blake condition. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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