Abstract Submitted
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Spin-coating of layered liquids ALAN MCINTYRE, LUCIEN BRUSH, University of Washington — An axisymmetric model of the spin-coating of two immiscible, vertically stratified liquids is derived using lubrication theory. The model includes gravitational, van der Waals, capillary, viscous forces and evaporation/condensation processes. During the evolution of uniform layers, the lower layer thins monotonically and never reaches zero thickness. With evaporation the upper layer disappears in finite time. With condensation the upper layer reaches a steady-state thickness. Fully nonlinear calculations, including viscous and evaporation/condensation effects, show that disturbances of the lower layer have a greater effect on the upper layer than disturbances of the upper layer have on the lower layer. Disturbances along the upper gas-liquid free surface propagate outward more rapidly than those along the lower liquid-liquid interface. The effects of additional forces on the evolution of bilayer films during spin-coating are also presented.

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