**Nonlinear Stability Analysis of a Two-Layer Thin Liquid Film: Dewetting and Autophobicity** LAEL FISHER, ALEXANDER GOLOVIN, Northwestern University — The nonlinear analysis of a two-layer thin liquid film on a solid substrate is performed. Weakly nonlinear stability analysis of nonlinear evolution equations for the two interfaces reveals that coupling of van der Waals interactions in the layers can lead to an autophobic behavior of the film, similar to spinodal decomposition. Numerical simulations of the strongly nonlinear evolution equations confirm this conclusion. The effect of both soluble and insoluble surfactants on the film stability is also studied. It is shown that the presence of surfactants can lead to an osillatory instability of a two-layer film that manifests itself as dewetting waves.

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