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Thin films: instabilities, waves, and dewetting TE-SHENG LIN, LOU KONDIC, New Jersey Institute of Technology — We study free surface instabilities of spreading thin films exposed to destabilizing body force (gravity) on partially wetting substrates. For completely wetting films on inverted substrates, we have uncovered rich structure of convective and absolute instabilities which evolve due to contact line presence.[1] In this talk, we will concentrate on partially wetting case, where additional destabilizing component of disjoining pressure may lead to significant modifications of the instabilities discovered for the complete wetting case. In particular, we consider the interplay between different destabilizing mechanisms to discuss free surface instabilities which lead to dewetting, in contrast to those which do not. We conclude by presenting preliminary results of three dimensional simulations showing the interplay between free surface and fingering type of instabilities.

[1]T.-S. Lin, L. Kondic, Phys. Fluid 22, 052105 (2010).

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