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Thomas P Witelski* (witelski@math.duke.edu), Dept of Math, Duke University, Box 90320, Durham, NC 27708-0320. *On computing solutions of thin film equations.*

Thin film equations are a class of fourth-order nonlinear partial differential equations motivated by the Reynolds lubrication equation for the evolution of free-surface flows of thin layers of viscous fluids spreading on solid surfaces. There are many issues that make computing solutions of such parabolic PDEs difficult, including the lack of a maximum principle, degeneracy of the mobility coefficient and associated questions about regularity and uniqueness of compactly-supported weak solutions. We discuss regularizations of thin film equations for computing (i) non-negative finite-time blow-up and (ii) spreading solutions with sign-changes on the half-line. (Received February 04, 2009)