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Thomas Hagen* (thagen@memphis.edu), Dunn Hall 367, Department of Mathematical Sciences, The University of Memphis, Memphis, TN 38152. *Analytical aspects in the theory of free liquid fibers and sheets.*

Models of thin free liquid jets and sheets considered here are based on two assumptions: thinness of the fiber/film and dominant viscous forces. As a result of these assumptions the governing equations for these flows take on the form of a system of nonlinear coupled elliptic–hyperbolic partial differential equations. They represent formal asymptotic limits of the full Navier-Stokes equations with free surface.

In this presentation we will address recent analytical results in the theory of free liquid fibers and sheets, primarily pertaining to fiber spinning and film casting. Central themes will be the existence and stability of equilibrium solutions and global existence results. (Received August 29, 2011)