1033-35-56 **Michael Shearer*** (shearer@ncsu.edu), Department of Mathematics, NC State University, Raleigh, NC 27695-8205. *Flow of a surfactant-laden thin liquid film down an inclined plane.*

A thin liquid film flowing down an inclined plane can be described in the lubrication approximation by a scalar fourth-order nonlinear partial differential equation. In this case, the traveling wave solution of the PDE depends only on the upstream and downstream heights. The addition of insoluble surfactant dramatically alters the free surface of the film. A second equation modeling the transport and diffusion of surfactant is coupled to the height equation, and the new system only admits traveling wave solutions for a range of upstream and downstream heights. We explore the dependence of the traveling waves on capillary, Peclet and Bond numbers with numerical simulations and asymptotics. (Received August 29, 2007)