1067-Z1-1828 **Kumnit Nong*** (knong@gmu.edu), 4400 University Dr, Fairfax, VA 22030, and **Daniel M Anderson** (danders1@gmu.edu), George Mason University, Department of Mathematical Sciences, 4400 University Dr, Fairfax, VA 22030. *Thin Film Evolution over a Thin porous Layer: Modeling a Tear Film on a Contact Lens.*

We examine a mathematical model describing the behavior of the precontact lens tear film of a human eye. Our work examines the effect of contact lens thickness and lens permeability on the film dynamics. Also investigated are gravitational effects and the effects of different slip models at the fluid-lens interface. A mathematical model for the evolution of the tear film is derived using a lubrication approximation applied to the hydrodynamic equations of motion in the fluid film and the porous layer. The evolution equation is solved numerically, and the effects of various parameters on the rupture of the thin film are studied. We find that increasing the lens thickness, permeability, and slip all contribute to an increase in the film thinning rate, although for parameter values typical for contact lens wear, these modifications are minor. Gravity plays a role similar to that for tear films in the absence of a contact lens. The presence of the contact lens does, however, fundamentally change the nature of the rupture dynamics as the inclusion of the porous lens leads to rupture in finite time rather than infinite time.interaction. (Received September 21, 2010)