1067-76-1374   **Kevin Talbott*** (`ktalbott@gmu.edu`), 4307 Salina Ct., Fairfax, VA 22030. *Modeling the Evaporation of a Tear Film over a Contact Lens.*

A contact lens is porous and thus fluid can flow between the Post-lens Tear Film (PoLTF), which is the fluid between the corneal surface and the contact lens, and the Pre-Lens Tear Film (PrLTF), which is the fluid on top of the contact lens exposed to the air. Our tear film model allows for fluid transfer through the lens and includes the effects of evaporation of the PrLTF. Governing equations include Navier-Stokes equations, heat equation and Darcy's equation for the fluid flow and heat transfer in the fluid film and porous layer. In a one-dimensional tear film model, parameters are changed to find possible steady state solutions and the time it takes to reach them. Also of interest is the possible depletion of the PoLTF via evaporation of the PrLTF. The one-dimensional model can be reduced to an ODE that can be solved numerically or analytically. We also explore a two-dimensional tear film model described by a PDE that is first order in time and fourth order in space. (Received September 20, 2010)