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Maria A. Corsaro* (mcorsaro@nd.edu), 803 Cottonwood Drive, Malvern, PA 19355, and **Dan Anderson** and **Padmanabhan Seshaiyer**. *Modeling the Human Tear Film during a Blink while Wearing a Contact Lens*. Preliminary report.

Millions of people worldwide wear contact lenses. The presence of a contact lens on the eye changes the behavior of the human tear film. This relationship is examined during the period of the blink when the upper eyelid is opening. A model is created through the use of standard thin film assumptions and is then reduced to a nonlinear partial differential equation for the thickness of the tear film. Two different models for the lipid layer are also incorporated into the model. A numerical solution to the partial differential equation is calculated using the method of lines to discover the shape of the tear film for the specific set of conditions being explored. There are still several variables that remain to be calculated in order to produce accurate results to answer this research question. However, it is possible to compute solutions describing the initial and final tear film height for the case where the upper eyelid is stationary and there is no contact lens. This proof-of-concept test successfully demonstrates that this model is able to accurately represent these cases. It is therefore logical that the next step in the development of this model is to estimate these remaining parameters so that results can be produced that reflect the desired situation. (Received September 16, 2013)