

Abstract Submitted
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Tear Film Dynamics for Blink Cycles with a Wetting Cornea and Evaporation R.J. BRAUN, J. TANG, L.P. COOK, University of Delaware, D.M. ANDERSON, George Mason University — We consider a lubrication model in one spatial dimension for the human tear film. The ends of the domain move to mimic the blink cycle of the eyelids; the underside of the film is wettable surface due to a conjoining pressure and evaporation occurs from the top surface of the film. The film can equilibrate at a small finite thickness where the conjoining pressure and evaporation balance. This small thickness is interpreted as a dry spot; the model can compute past dry spot formation. Results are given for the film dynamics with either pressure or flux boundary conditions on the ends of the film. The film can form dry spots for some boundary conditions of either type. The persistence of the dry spots with respect lid motion and other effects are explored.

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