Abstract Submitted
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Tear film dynamics with evaporation and osmolarity JAVED SIDDIQUE, Penn State, York, RICHARD BRAUN, University of Delaware — We consider a model problem for the evaporation and breakup up of tear film. The model includes the effects of surface tension, Marangoni stresses, insoluble surfactant transport, evaporation, osmolarity transport, osmosis and wetting of corneal surface. Evaporation is made dependent on surface concentration in order to mimic the lipid layer of the tear film when there is a single fluid layer in the model. In many cases for a single layer, the Marangoni effect seems to eliminate a localized area of increased evaporation due to reduced surfactant concentration. In this model the osmolarity in the tear film increases because of average evaporation rate rather than by a locally increased evaporation rate. If time permits, the effect of having a second fluid layer, representing the lipid layer, will be explored as well.

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