Abstract

This paper generalizes the model of Aydemir et al. (2010) by approximating the cornea surface as spherical rather than flat. The model, which consists of a pair of coupled nonlinear partial differential equations for the thickness of the aqueous layer and the concentration of the lipid, is solved in the domain squeezed between a moving upper lid and fixed lower lid. Away the upper lid the curvature has a weak influence on the film thickness; this confirms the conclusion of Braun et al. (2012). However, the curvature influences the thinning rate of the tear film near the upper eyelid.