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Two Layer Model for Local Tear Film Dynamics NICHOLAS GEWECKE, RICH BRAUN, University of Delaware, CHRIS BREWARD, University of Oxford, EWEN KING-SMITH, The Ohio State University — Many tear film models utilize a single-layer approach that represents only the aqueous layer, which constitutes the majority of the tear film. In such models, the layer is dominated by shear stresses. Some recent models have incorporated surfactant effects at the liquid-air interface to model the effects of polar lipids there. Clinical observations of the lipid layer indicate more complicated dynamics of the lipid layer than demonstrated by these previous models. The model presented in this talk includes a thin lipid layer between the aqueous layer and the air, which is treated as an extensional flow. Our results demonstrate formation of lipid drops, with the number of drops dependent upon the parameters of the system, especially the thickness ratio between the lipid and aqueous layers.

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