1163-49-1263 **Rayanne A. Luke*** (rayanne@udel.edu), **Richard J. Braun**, **Tobin A. Driscoll**, **Carolyn G. Begley** and **Deborah Awisi-Gyau**. *Parameter Identification for Tear Film Thinning.*

Dry eye syndrome is thought to be caused by breakdown of a uniform tear film, which occurs when the tear film experiences breakup. The dynamics of the tear film can be studied using fluorescence imaging. Many parameters affect tear film thickness and fluorescent intensity distributions over time; exact values or ranges for some are not available. We estimate breakup parameters by fitting to experimental fluorescent intensity data gathered from normal subjects' tear films *in vivo*. The fitting is done with thin film fluid PDE models for the tear film thickness, osmolarity and fluorescein concentration with circular (spot) or linear (streak) geometry. The corresponding fluorescent intensity is computed from the tear film thickness and fluorescein concentration. The parameters are determined by a nonlinear least squares minimization between computed and experimental fluorescent intensity. The results vary across subject trials. Optimal values for variables that cannot be measured *in vivo* within tear film breakup often fall within accepted experimental ranges for related tear film dynamics; however, some instances suggest that a wider range of parameter values may be acceptable. This new understanding of tear breakup may lead to better understanding of dry eye. (Received September 15, 2020)