A Two-Dimensional Model for Tear Flow through a Permeable Contact Lens[1] MATTHEW GERHART, George Mason University, DANIEL ANDERSON, George Mason Universty — This is an investigation into the flow of an incompressible fluid in a thin pre-lens, contact lens, and post-lens system. The pre-lens and post-lens layers are coupled through the middle layer being a thin permeable contact lens. Included in this system are the effects of evaporation of the pre-lens film and the settling of the contact lens over time. This analysis is done through the nondimensionalization of the governing equations which include the Navier-Stokes' equations for the pre- and post-lens tear film and Darcy's equations for the contact lens layer along with heat equations for temperature. Lubrication theory is then applied to the resulting system leaving a reduced coupled system of equations whose properties we explore.

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