1125-76-2427 **Joshua Chasen***, School of Mathematical Sciences, Rochester Institute of Technnology, Rochester, NY 14623, **Roland Sanford**, School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623, **Kara Maki**, School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623, and **David Ross**, School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623. *The Deformation of an Eye Caused by a Contact Lens.*

In this work, we aim to better understand how the design of contact lenses can be optimized for patient comfort and ocular fit. Specifically, we study how the eye tissue deforms when a contact lens is inserted on the eye. To do so, we implement a high-order accurate scheme to solve a system of partial of differential equations modeling the elastic stresses induced in an eye by a contact lens on its surface. The suction pressure distribution produced by a radially symmetric contact lens is characterized by a system of ordinary differential equations depending on the shape of the surface of the eye, the shape of the undeformed contact lens, and the material properties of the contact lens. We explore how different contact lens shapes, contact lens material properties, and eye tissue properties affect the deformation of the eye tissue. (Received September 20, 2016)