

1096-VG-1980      **Keith Wojciechowski** and **Kelsey Linnell\***, klinnell@bowdoin.edu. *A Mathematical Model for a Self-Expanding Hemostatic Bandage.*

In this talk we discuss the use of a nonlinear partial differential equation (PDE) to model the absorption and swelling behaviors of a bandage made with Self Expanding Hemostatic Polymers (SEHPs). The PDE may be viewed as the result of applying some simplifying assumptions to a nonlinear Volterra partial integrodifferential equation used in the modeling of biopolymers. We applied this PDE to model a square bandage and prescribed boundary conditions appropriate for the case where a wound saturates the center of the bandage but flow is not permitted along any of the exterior edges. Behavior of the model is analyzed through analytic techniques and compared to known viscoelastic properties of polymer diffusion. We confirm that the simplified model captures the desired behavior of non-Fickian diffusion thus indicating that it may be applied successfully to modeling SEHP bandages. Numerical solutions for a assortment of diffusion coefficients are then presented and discussed in terms of this expected behavior. (Received September 17, 2013)