

## **Simple mechanics for treating swelling in fiber reinforced hyperelastic materials**

Thomas J. Pence  
Department of Mechanical Engineering  
Michigan State University

This talk will discuss certain aspects of a simple generalization of anisotropic hyperelasticity that treats the material natural free volume as a field quantity and hence potentially coupled to non-mechanical causes. In particular, the treatment may apply to non-swelling fibers in a matrix that undergoes swelling. A variable swelling field in the context of a boundary value problem then admits an interpretation as a configurational force, and can give rise to a number of interesting effects. Certain aspects of swelling induced degradation of either the matrix or fiber component can be incorporated by standard kinetic arguments. This is joint work with H. Demirkoparan and S. Baek.