1154-VC-484 **Sarah Ritchey Patterson*** (pattersonse@vmi.edu), Applied Mathematics, 402 Mallory Hall, Virginia Military Institute, Lexington, VA 24450. *Modeling Vascular Congestion in the Microcirculation.*

Blood flow can be modeled as a fluid-structure interaction problem in which the vessel is represented as an infinitely thin, elastic interface that exerts a singular force on the internal and surrounding fluid. The immersed interface method was created to solve this type of immersed boundary problem with second-order accuracy in space and time. However, the interface must be a closed shape, which is not conducive to modeling flow in a vessel.

An extension of the immersed interface method is presented to numerically solve immersed boundary problems where the interface is shaped like an open tube that transverses the fluid domain. Additionally, two mathematical models for simulating renal blood flow under physiological and pathophysiological conditions are presented. The first model simulates the effect of pericyte contractions on vascular congestion in the descending vasa recta. The second model simulates the auto-regulatory myogenic response to changes in systolic blood pressure in the afferent arteriole. (Received September 05, 2019)