1126-65-407 **Truong Q Nguyen*** (tqn4@pitt.edu), 141 North Dithridge st, Apt 36, Pittsburgh, PA 15213, and **Ivan Yotov** (yotov@math.pitt.edu), Department of Mathematics, 301 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260. *A nonlinear Biot-Stokes model for the interaction of a non-Newtonian fluid with poroelastic media.* Preliminary report.

The interaction between a free fluid with a deformable porous medium has a wide range of application, including hydraulic fracturing, designing industrial filters, and blood flow. We investigate a mathematical model of the coupled Biot-Stokes equations and its finite element approximation. The free fluid flow is modeled by the Stokes equations and the poroelastic material is model by the Biot system. The continuity of flux interface condition is imposed using a Lagrange multiplier. We admit that the fluid possesses the shear-thinning property, i.e., the viscosity decreases under shear strain, which results in a non-linear Biot-Stokes model. We present the well-posedness of the continuous weak formulation as well as the semi-discrete continuous-in-time formulation. The stability and error analysis for the semi-discrete scheme are presented. Numerical experiments illustrate the convergence of the scheme and an application to modeling the interaction between a stationary fracture filled with fluid and the surrounding poroelastic reservoir. (Received January 18, 2017)