1163-76-1060 **Yuan-Nan Young*** (yyoung@njit.edu), 519 Cullimore Hall Dept. of Math. Sci., University Heights, NJIT, Newark, NJ 07102, and **James Feng**, Department of Mathematics, University of British Columbia, Vancouver, BC V6T 1Z2, Canada. *Modeling and Simulating Hydrogel as a Viscous Fluid in a Deformable Porous Medium.*

Hydrogels consist of a polymer skeleton hydrated by an aqueous solvent, and their hydrodynamics is often described by a coarse-grained poroelasticity model where the boundary conditions between the hydrogel and a surrounding solvent require careful consideration. Young et al. (Phys. Rev. Fluids, 4, 063601, 2019) used the energy dissipation principle to derive a set of boundary conditions regarding the velocity jumps at the interface. However, when applied to an external shear flow over a gel layer, these conditions predict no entrained flow inside the gel, in contrast to the prediction of a previous model by Minale (Phys. Fluids 26, 123102, 2014). We adapt Young et al.'s procedure to derive an alternative set of boundary conditions that does allow an external shear flow to induce shear inside the gel, and compare the velocity profile to that of Minale. We also derive the limiting form of the boundary conditions in a Darcy medium. (Received September 14, 2020)