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Lorena Bociu* (lvbociu@ncsu.edu). *The role of structural viscosity in poro-visco-elastic models.*

Fluid flow through porous elastic or viscoelastic structures is relevant for many applications in biology and medicine, like tissue perfusion in the body. There is strong evidence that disruption of fluid flow inside the pores can damage the medium. We consider a system of PDEs that models fluid flow through poro-(visco)-elastic material, with permeability depending nonlinearly on the solid strain, and with volumetric and boundary forcing terms. We investigate the existence of weak solutions and the influence of viscoelasticity on the regularity of solution and forcing terms. We provide numerical evidence that sudden changes in volumetric and/or boundary sources of linear momentum may lead to uncontrolled fluid-dynamical responses if the solid component of the medium is not viscoelastic. This finding could have tremendous consequences on the understanding of many pathological conditions, such as glaucoma. [L. Bociu, G. Guidoboni, R. Sacco, and J. Webster, Analysis of nonlinear poro-elastic and poro-visco-elastic models, *Archive for Rational Mechanics and Analysis*, 222 (2016), 1445-1519]. (Received September 19, 2016)