Flow of a particulate mixture in a micro-channel WEITAO WU, Carnegie Mellon University, NADINE AUBRY, Northeastern University, MEHRDAD MASSOUDI, National Energy Technology Laboratory (NETL) — We consider the flow of a mixture of granular materials and a viscous fluid in a micro-channel. We use Mixture Theory to treat this problem as a two-component system. One component (the granular materials) is modeled as a generalized Reiner-Rivlin type fluid, which not only considers the effects of volume fraction but also has a viscosity which depends on the shear rate. The other component (the host fluid) is assumed to behave as a linear viscous fluid. Lift and drag forces exerted by the fluid onto the discrete (solid) particles are taken into account. In order to gain insight into the nature and influence of the various terms in the two phase model we perform a parametric study. Results for the volume fraction and the velocity profiles will be presented.

Weitao Wu
Carnegie Mellon University