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Jill Reese  
**Modeling non-Darcy single-fluid-phase flow in porous  
medium systems**

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A non-Darcy partial differential equation (PDE) model for single-phase flow through porous media is presented. The model is not only nonlinear in the non-Darcy term, but also in the advection term which appears in the momentum conservation law. The focus of this talk is on the numerical implementation of the model using the Sandia National Laboratories PDE simulation framework, Sundance. In particular, the discussion will include the finite element discretization and the effect of the heterogeneity of the media.