1137-76-99 **Joe Umhoefer*** (umhoefej@oregonstate.edu), **Malgorzata Peszynska** and **Timothy Costa**.

Influence of Changing Geometries on Pore Scale Flow and Transport Models.

We consider a coupled system of PDEs for modeling viscous flow and transport in complex geometries. We use the Stokes equation to describe the flow and we model transport with an advection-diffusion equation. The geometry of the domain in which we solve this problem is the void (pore) space between the rock grains, also known as the pore scale. After we solve an IBVP at the pore scale [μm-mm], we use (numerical) homogenization to inform macro scale [m-km] models through upscaling.

Pore scale simulations can help to predict many important properties of flow and transport at higher scales, and have become ubiquitous in applications to geosciences, from fundamental geologic processes to energy resource storage and production. When pore scale geometry changes, crucial macro scale parameters such as porosity and permeability change as well. A pore scale flow model should be flexible in accounting for geometry changes, and in modeling the coupling to the (transport or phase change) processes changing the pore geometry. In this presentation we show the impact of changes in the pore scale geometry on upscaled results. For flow solutions at the pore scale we use HybGe-Flow3D, a library designed for the solution of fluid flow problems in complex, uncertain and evolving geometries. (Received February 05, 2018)