

ADVANCED TECHNIQUES FOR TRANSPORT PHENOMENA IN HETEROGENOUS POROUS MEDIA

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Fluid flow in porous media is ubiquitous in many natural and engineering applications, such as groundwater flow and contaminant transport, oil and gas extraction, soil remediation, filtration processes, and enhanced oil recovery techniques. Accurate descriptions of flow behavior in heterogeneous porous media with different surface properties and microstructures is often desired. We here establish a mini-symposium to provide a forum for sharing and exploring recent progress on the development and application of numerical methods for fluid flow in porous media. Examples of specific areas include – but are not limited to – the following:

- Development and application of numerical methods (direct numerical simulation, FVM/FEM, lattice Boltzmann method, smoothed particles hydrodynamics, pore-network models, etc)
- Flow physics (Newtonian, non-Newtonian, miscible/immiscible, viscoelastic)
- Passive/reactive transport (mixing, dispersion, dissolution, precipitation)
- New physical insights and theoretical analyses
- Frameworks for upscaling of effective properties (nano-scale, pore-scale, Darcy-scale descriptions)
- Applications involving isotropic/anisotropic porous materials with heterogeneous porosity/wettability.