

1105-65-244

Guglielmo Scovazzi* (guglielmo.scovazzi@duke.edu), Room 121 Hudson Hall, Box 90287, Durham, NC 27708-0287. *A high-order, fully-coupled, upwind, compact discontinuous Galerkin method for modeling of viscous fingering in compressible porous media.*

We present a new approach for high-fidelity porous media flow simulation, based on a fully coupled, upwind, high-order discontinuous Galerkin formulation of miscible (compressible) displacement transport. The proposed method is flexible on complex subsurface geometries and captures the strong interaction between pressure and transported concentrations in highly compressible media. It also shows very low sensitivity to mesh orientation and its robustness and accuracy are demonstrated in a number of compressible and incompressible multiphase flow problems. (Received September 22, 2014)