

1096-65-189

Michaela J. Kubacki* (mjk63@pitt.edu), Department of Mathematics, University of Pittsburgh, 301 Thackeray Hall, Pittsburgh, PA 15260. *Uncoupling Groundwater-Surface Water Flow Using Partitioned Methods.*

The Stokes-Darcy equations arise in many environmental problems, such as tracking groundwater-surface water contamination. Partitioned methods for evolutionary Stokes-Darcy equations uncouple the system so that at each time step we solve separate ground- and surface water flow problems using codes optimized for the physics in each sub-domain. Challenges include finding methods that converge within a reasonable amount of time, are stable when the physical parameters of the flow are small, and maintain stability and accuracy along the interface. An analysis of the Crank-Nicolson Leapfrog scheme, a higher order numerical method, gives rise to a CFL-type condition for stability and convergence. Numerical tests confirm the results of the analysis. The method is improved with the addition of stabilizing terms and can then be coupled with convection-diffusion equations to model the transport of contaminants. (Received August 14, 2013)