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**Xiaoming He\*** ([hex@mst.edu](mailto:hex@mst.edu)), 400 W. 12th St., Department of Mathematics and Statistics, Missouri University of Science and Technology, Rolla, MO 65401. *Multi-grid and multi-level Monte Carlo method for Stokes-Darcy model with random permeability*. Preliminary report.

Stokes-Darcy type models have attracted significant attention since it arises in many applications such as surface and subsurface flow interaction, groundwater flows in karst aquifers, petroleum extraction and industrial filtration. In the natural world, a lot of porous media has random permeability, especially in the subsurface flow system. We present multi-grid and multi-level Monte Carlo method for solving a stochastic Stokes-Darcy model with random permeability. Compared with the traditional Monte Carlo method, this method can significantly reduce the number of samples, hence improve the efficiency. Both theoretical and numerical results are presented to illustrate this method. (Received August 15, 2018)