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Todd Arbogast* (arbogast@ices.utexas.edu), The University of Texas at Austin, Department of Mathematics C1200, Austin, TX 78712, and **Kirsten J Boyd, Michael S Lubke** and **James M Rath**. *Mixed Variational Multiscale Modeling of Stochastic Porous Media*.

We present the mixed variant of the Variational Multiscale Method and apply it to stochastically generated porous media. The method results in a course-scale problem on a mesh of large elements of diameter H . We compare the upscaled solution to the fine-scale, fully resolved solution, and show how the solution degrades as the correlation length of the geostatistics of the medium increases as compared to H . We also show how the upscaling procedure can be used to solve the fine-scale problem more efficiently in a type of multi-grid algorithm. (Received September 28, 2005)