

1159-65-96

Sai-Mang Pun* (smpun@math.tamu.edu), Department of Mathematics, Mailstop 3368, College Station, TX 77843. *Computational methods and model reductions for multiscale problems in heterogeneous porous media.*

In this talk, we introduce the Constraint Energy Minimizing Generalized Multiscale Finite Element Method and illustrate how it can be employed to solve problems with multiscale features arising in engineering applications. The proposed method makes use of the idea of energy minimization with suitable constraints to generate efficient basis functions for the variables related to governed partial differential equations. These basis functions are constructed by solving a class of local auxiliary optimization problems based on eigenfunctions containing local information on the heterogeneity. Techniques of oversampling are adapted to enhance the computational performance. A number of numerical examples will be provided to illustrate the performance of the proposed methodology. (Received August 01, 2020)