Department of Mathematics

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Scientific Computing Seminar

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A Finite Volume Scheme with the Discrete Maximum Principle for Diffusion Equations on Polyhedral Meshes

Thursday, Oct. 30, 2014
1:30 PM- 2:30 PM
Room 646 PGH

Abstract:

We present a cell-centered multi-point finite volume scheme for the 3D diffusion equation with the compact stencil formed mostly by the closest neighboring cells. The discrete solution satisfies the discrete maximum principle and approximates the exact solution with second-order accuracy. The coefficients in the FV stencil depend on solution; therefore, the FV scheme is nonlinear. The scheme is applied to the steady state diffusion equation discretized on a general polyhedral mesh. Results of several numerical examples are presented.