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Xianping Li* (lixianp@umkc.edu) and **Weizhang Huang** (whuang@ku.edu). *Anisotropic mesh adaptation for 3D anisotropic diffusion problems.*

Anisotropic diffusion problems arise from many fields of science and engineering. One of the challenge tasks for those problems is to avoid non-physical solutions or spurious oscillations in the numerical computations. A common approach is to design a proper discretization scheme and/or a proper mesh so that the numerical solution satisfies the discrete maximum principle (DMP). In this talk, the mesh adaptation strategies for three-dimensional anisotropic diffusion problems are presented. The results for 2D problems are extended to 3D problems and the conditions on mesh qualities such that numerical solutions satisfy DMP are developed. Some numerical examples are presented. (Received January 20, 2015)