**A DFEM Formulation of the Diffusion Equation on Arbitrary Polyhedral Grids**

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In this work, we present a formulation of the diffusion equation using a piece-wise linear discontinuous (PWLD) finite element discretization for arbitrary polyhedral meshes. It is derived from the standard diffusion form and uses the symmetric interior penalty (SIP) method. The bilinear form of SIP yields a symmetric positive-definite system matrix which is easily solved with a preconditioned conjugate gradient algorithm. We test the SIP formulation on several 3D prismatic grids that are formed from the axial extrusion of 2D polygonal meshes. The PWLD basis functions capture a purely linear solution, even on unstructured grids with highly distorted mesh cells. We also verify the proper second-order convergence properties using the Method of Manufactured Solutions.