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A New Approach for Imposing Artificial Viscosity for Explicit Discontinuous Galerkin Scheme YEE CHEE SEE, YU LV, MATTHIAS IHME, Stanford University — The development of high-order numerical methods for unstructured meshes has been a significant area of research, and the discontinuous Galerkin (DG) method has found considerable interest. However, the DG-method exhibits robustness issues in application to flows with discontinuities and shocks. To address this issue, an artificial viscosity method was proposed by Persson et al. for steady flows. Its extension to time-dependent flows introduces substantial time-step restrictions. By addressing this issue, a novel method, which is based on an entropy formulation, is proposed. The resulting scheme doesn't impose restrictions on the CFL-constraint. Following a description of the formulation and the evaluation of the stability, this newly developed artificial viscosity scheme is demonstrated in application to different test cases.

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