

# Entropy Viscosity for Nonlinear Conservation Laws

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A new class of high-order numerical methods for approximating nonlinear conservation laws is described (entropy viscosity method). The novelty is that a nonlinear viscosity based on the local size of an entropy production is added to the numerical discretization at hand. This new approach does not use any ux or slope limiters, applies to any equation or system with one or more complementary entropy equations and does not depend on the mesh type and polynomial approximation. Various benchmark problems are solved with finite elements, spectral elements and Fourier series to illustrate the capability of the proposed method. The effect of the mass matrix is also discussed.