

Nonlinear Stability of the Compressible Navier-Stokes Using Summation-by-parts operators

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A high-level overview of the SBP entropy stability literature is given. Nonlinearly (entropy) stable discretizations of arbitrary order exist for the compressible Navier-Stokes (NS) equations for diagonal norm, tensor-product and multi-dimensional, summation-by-parts (SBP) operators. Recent developments are discussed: 1) Curvilinear brick elements, 2) finite-difference and spectral collocation WENO operators, 3) multidimensional extensions (triangular and tetrahedral elements), 4) nonconforming h- and p-refinement and 5) nonlinearly stable boundary conditions,