Abstract Submitted
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A Derivation of New Regularized Euler Equations from Basic Principles[1] KAMRAN MOHSENI, University of Colorado at Boulder — Both turbulence and shock formation in inviscid flows are prone to high wave number mode generations. This continuous generation of high wavemodes results in energy cascade to ever smaller scales in turbulence and creation of shocks in compressible flows. This high wavenumber problem is often remedied by the addition of a viscous term in both compressible and incompressible flows. The author's group recently reported a regularization technique for the Burgers equation (Norgard and Mohseni 2008) which is now extended to one-dimensional compressible Euler equations (Norgard and Mohseni 2009). This investigation presents a formal derivation of these equations from basic principles. We will extend our previous results to multidimensional compressible and incompressible Euler equations. We expect this technique to simultaneously regularize shocks and turbulence. Numerical simulation demonstrating the shock regularization properties of these equations will be presented.

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