Abstract Submitted
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A numerical method for DNS of turbulent reacting flows[1] JEFFREY DOOM, YUCHENG HOU, KRISHNAN MAHESH, University of Minnesota — A non-dissipative, implicit numerical method is described to simulate turbulent reacting flows with simple chemistry over a range of Mach numbers. The compressible Navier-Stokes equations are rescaled so that the zero Mach number equations are discretely recovered in the limit of zero Mach number. The dependent variables are colocated in space, and thermodynamic variables are staggered from velocity in time. A novelty of the algorithm is that it discretely conserves kinetic energy in the incompressible limit. This makes it robust without compromising accuracy. Details and numerical examples of both premixed and diffusion flames will be presented.

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