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April 24, 2014

Professor William Martin
Editor,
Journal of Computational Physics

Dear Professor Martin,

Please find attached a copy of our manuscript titled "Numerical solution of the 1-D grey radiation hydrodynamics equations with an entropy-based artificial viscosity" for submission to the *Journal of Computational Physics*.

In this paper, we extend the entropy-based stabilization, devised by Guermond et al. for Euler equations, to the radiation hydrodynamics equations with grey non equilibrium diffusion. Our viscous stabilization, based on entropy production, is derived for the 1-D grey radiation hydrodynamics equations. The technique is independent of the choice of spatial discretization and we have chosen to solve the equations with *continuous* finite elements. Several standard 1-D radiation-hydrodynamic test cases with shocks (from Mach 1.05 to Mach 50) are computed to establish the ability of the technique at capturing and resolving shocks. Most of the numerical test cases are taken from Lowrie and Edwards (Radiative shock solutions with grey non equilibrium diffusion, *Shock Waves* (2008) 18:129-143).

The suggested reviewers are experts in radiative shock solutions: Rob Lowrie (LANL), James Stone (Princeton University), and Robert Rieben (LLNL).

Thank you for considering this manuscript for publication in JCP.

Best regards,

Marc Delchini, Jim Morel, Jean Ragusa