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Radial Basis Functions as Generators of the Inviscid Burger's Equation CARTER BALL, CARLOS CABRERA, MARISSA ADAMS, PIERRE-ALEXANDRE GOURDAIN, University of Rochester — A perennial struggle in the world of interpolation is accurately capturing steep gradients and discontinuities without nonphysical oscillations such as the Gibbs phenomenon. Radial basis functions are a relatively new tool for solving partial differential equations that show great promise due to their ability to work mesh-free and capability to be generalized to multiple dimensions [Sara, Applied Numerical Mathematics 2005]. In this study, we utilize radial basis functions (RBFs) to construct nodal radial basis functions (NRBFs), functions that are one at one center and zero at all other centers. We then use these NRBFs as a basis to solve the inviscid 1D Burger's equation which is known for developing shocks. The goal of this study is to improve shock capturing capabilities in implicit magnetohydrodynamics code.

Carter Ball
University of Rochester

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