

Abstract Submitted
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Tests of Limiters for Discontinuous Galerkin Advection Algorithms¹ SETH DAVIDOVITS², AMMAR HAKIM, GREG HAMMETT, Princeton Plasma Physics Laboratory — In continuum kinetic plasma simulations, maintenance of the positivity of the distribution function and monotonicity (avoiding numerically-generated oscillations) is important for a physical solution. Here, we investigate issues surrounding maintaining positivity (and the more restrictive property of monotonicity) when using a discontinuous Galerkin (DG) approach. We are particularly interested in methods that do not break conservation properties of the solution algorithm and are amenable to implementation in high dimensional spaces without prohibitive computational difficulty. While finite volume approaches keep track of a cell mean, the discontinuous Galerkin method makes use of a number of higher solution moments and interpolations to quadrature points using these moments. Because of this fact, positivity enforcing methods that are successful for finite volume means do not necessarily guarantee a positive discontinuous Galerkin solution. Performance of several different limiting schemes on some tests cases will be shown.

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