

Title :

CONSERVATIVE DISCONTINUOUS GALERKIN/HERMITE SPECTRAL METHOD FOR THE VLASOV-POISSON SYSTEM

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Abstract.

We propose a class of conservative discontinuous Galerkin methods for the Vlasov-Poisson system written as an hyperbolic system using Hermite polynomials in the velocity variable. These schemes are designed to be systematically as accurate as one wants with provable conservation of mass and possibly total energy. Such properties in general are hard to achieve within other numerical method frameworks for simulating the Vlasov-Poisson system. The proposed scheme employs discontinuous Galerkin discretization for both the Vlasov and the Poisson equations, resulting in a consistent description of the distribution function and electric field. Numerical simulations are performed to verify the order of accuracy and conservation properties.