

HYBRID KINETIC/FLUID NUMERICAL METHOD FOR THE VLASOV-BGK EQUATION IN THE DIFFUSIVE SCALING

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This work presents an extension of the hybrid, model-adaptation method introduced in [1] for linear collisional kinetic equations in a diffusive scaling to the nonlinear mean-field Vlasov-Poisson-BGK model. The aim of the approach is to reduce the computational cost by taking advantage of the lower dimensionality of the asymptotic model while reducing the overall error. It relies on two criteria motivated by a perturbative approach to obtain a dynamic domain adaptation. The performance of the method and the conservation of mass are illustrated through numerical examples.

References

- [1] T. Laidin. Hybrid kinetic/fluid numerical method for the Vlasov-BGK equation in the diffusive scaling. Submitted.