

# A Collision-Based Hybrid Method for Multiscale, Linear Transport

Advanced Optimization Techniques for Entropy-Based Moment Closures

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*Abstract*

We present a hybrid method for simulating kinetic equations with multiscale phenomena in the context of linear transport. The method consists of (i) partitioning the kinetic equation into collisional and non-collisional components; (ii) applying a different numerical method to each component; and (iii) re-partitioning the kinetic distribution after each time step in the algorithm. Preliminary results show that, for a wide range of test problems, the combination of a low-order method for the collisional component and a high-order method for the non-collisional component provides a level of accuracy that is comparable to a uniform high-order treatment of the entire system.

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