Accelerated Simulation for Plasma Kinetics

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Abstract
This presentation will describe acceleration of simulation methods for the Landau-Fokker-Planck equation, with a focus on a binary collision model that is solved using a Direct Simulation Monte Carlo (DSMC) method. Acceleration of this method is achieved by coupling the particle method to a continuum fluid description. Efficiency of the method is greatly increased by inclusion of particles with negative weights. This significantly complicates the simulation, and many difficulties have plagued earlier efforts to use negatively weighted particles. This talk will describe significant progress that has been made in overcoming those difficulties.