

Vlasov code simulations

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The current status of Vlasov codes and future prospects of their application to space weather modeling research are discussed. Due to their low noise level, Vlasov codes are widely used for studies of nonlinear wave-particle interactions in plasmas. Vlasov code simulations are one of candidates for a future space weather modeling of full-kinetic processes in Geospace, because Vlasov codes are free from thermal fluctuations which is a great advantage over noisy particle-in-cell codes. On the other hand, we need a huge number of grid points in both configuration and velocity spaces to suppress numerical diffusion, which is a disadvantage of current Vlasov codes. In recent days, however, numerical interpolation schemes for Vlasov codes are rapidly developing. It is important to know the current Vlasov simulation techniques for a future studies of full-kinetic processes in Geospace.