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magnetized plasma

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We present an extension of the multi-moment advection scheme (Minoshima et al., 2011, J. Comput. Phys.) to the three-dimensional case, for full electromagnetic Vlasov simulations of magnetized plasma. The scheme treats not only point values of a profile but also its zeroth to second order piecewise moments as dependent variables, and advances them on the basis of their governing equations. Similar to the two-dimensional scheme, the three-dimensional scheme can accurately solve the solid body rotation problem of a gaussian profile with little numerical dispersion or diffusion. This is a very important property for Vlasov simulations of magnetized plasma. We apply the scheme to electromagnetic Vlasov simulations. Propagation of linear waves and nonlinear evolution of the electron temperature anisotropy instability are successfully simulated with a good accuracy of the energy conservation.

Multi-moment advection scheme in three

dimension for Vlasov simulations of

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Takashi Minoshima, Yosuke Matsumoto, Takanobu Amano

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