One and two dimensional electromagnetic gyrokinetic PIC simulation by $\delta f$ method

C.M. CHEN, Y. NISHIMURA, C.Z. CHENG, Institute of Space and Plasma Sciences, National Cheng Kung University — An electromagnetic gyrokinetic Particle-in-Cell simulation is studied aiming at long-wave-length magnetohydrodynamic instabilities. A fully nonlinear characteristic method ($\delta f$ method) of electrostatic gyrokinetic theory is employed.\(^1\) For a one dimensional geometry, “0.5 dimension” is taken in “$y$-direction” of the configuration space and another “0.5 dimension” is taken in the “$v_z$-direction” of the velocity space. Recent electromagnetic $\delta f$ simulation shows optimistic results.\(^2\) We revisit the importance of the conservation properties in the low dimensional geometries. This work is supported by National Science Council of Taiwan, NSC 100-2112-M-006-021-MY3 and NSC 103-2112-M-006-021-MY3.


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