Toward an implicit Drift-Lorentz mover\textsuperscript{1} R.H. COHEN, A. FRIEDMAN, D.P. GROTE, LLNL, J.-L. VAY, LBNL — In order to efficiently perform particle simulations in systems with widely varying magnetization, we have developed a “drift-Lorentz mover,” which interpolates between full particle dynamics and drift kinetics in such a way as to preserve a physically correct gyroradius and particle drifts for both large and small ratios of the timestep to the cyclotron period\textsuperscript{2}. We are now adding implicitness to the mover and the associated field solver in order to extend the mover’s applicability to systems with plasma frequency exceeding the cyclotron frequency. A first step was adding the polarization charge to the field solver and a two-time-level predictor corrector procedure \textsuperscript{3}. We outline here two approaches to adding further implicitness. In both, we add a direct-implicit algorithm to the Lorentz portion of the mover; the drift portion can then be treated as in Ref. 3, or fully implicitly, with a modified predictor-corrector procedure. We describe the algorithms, stability analyses, and status of implementation.

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