

Abstract Submitted  
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**Low-noise, energy-conserving implicit PIC**<sup>1</sup> D.C. BARNES, Coronado Consulting, L. CHACÓN, G. CHEN, Oak Ridge National Laboratory — The IMP method solves the collisionless Vlasov equation with an evolving background  $\delta f$  method which has a discrete exactly conserved energy. Obvious advantages are lack of several common PIC and  $\delta f$  diseases, such as aliasing instability and secular weight growth. We review previous demonstrations of the method for wave damping and two-stream instability. We present new two-dimensional, fully electromagnetic, fully nonlinear simulations of the g-mode. We also present the formulation of the problem with significant background temperature gradient, and show how to avoid growing weights by allowing mixing of the background to provide the required entropy increase. Initial results for the case of background temperature gradient are presented and show energy conservation and bounded weights..

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