

Abstract Submitted  
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**Perturbative Particle Simulation Studies of Periodically Focused Intense Charged Particle Beams**<sup>1</sup> WEIHUA ZHOU, HONG QIN, RONALD DAVIDSON, Princeton Plasma Physics Laboratory — High intensity charged particle beam propagation in a periodic focusing lattice has been studied numerically using a model in which the beam equilibrium and dynamical behavior are described self-consistently by the nonlinear Vlasov-Maxwell equations. To carry out this investigation, the Beam Equilibrium Stability and Transport (BEST) code, which uses a 3D low-noise perturbative particle simulation method, has been extended to periodic-focusing systems. The scheme begins with a smooth-focusing lattice, which is the smooth-focusing approximation for the periodic lattice, and adiabatically replaces the smooth-focusing lattice by the periodic-focusing lattice. Using this approach, periodic-focusing solenoidal configurations have been investigated using a slow turn-on time to minimize beam mismatch, and periodic-focusing quadrupole configurations have also been studied using this approach.

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