

Abstract Submitted
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Three-Dimensional Space-Charge Modeling of Intense Beams in a Circular Conducting Pipe¹ MARK HESS, CHONG SHIK PARK, Indiana University Cyclotron Facility — We demonstrate a novel 3-D method for modeling the space-charge fields of intense beams in a circular conducting pipe. In this method, we can solve the electromagnetic space-charge fields using two time-dependent Green's functions. Since these Green's functions satisfy the Helmholtz wave equation, the method is completely free of numerical dispersion making this method an ideal alternative to the traditional FDTD methods which are typically used for fully electromagnetic simulations. In addition, we show how this method can be implemented numerically to compute the space-charge fields of intense beams undergoing non-trivial motion, such as breathing mode oscillations.

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