

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

A Dispersion Free Methodology for Modeling Intense Charged Particle Beams¹ MARK HESS, Indiana University — We show a novel dispersion free 3-D method for modeling the space-charge fields of intense charged particle beams in a circular conducting pipe. The dispersion free aspect of this method is obtained from the use of time-dependent Green's functions for computing the fields. This leads to highly accurate representations of time-dependent space-charge fields in intense beams, compared to those found when using traditional FDTD methods where typical numerical grid dispersion errors can be important. We show how this method compares to the FDTD method, and how it can be parallelized for high-performance computing.

¹This work is supported by the AFOSR under grant FA9550-08-1-0160.

Mark Hess
Indiana University

Date submitted: 15 Sep 2010

Electronic form version 1.4