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Publication Date
2002-01-05

NTX: A Neutralized Final Focus System for High Intensity Beams

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Abstract

An experiment has been proposed to explore the performance of neutralized final focus systems for high perveance heavy ion beams. This final focus architecture involves a magnetic quadrupole lattice followed by ballistic neutralized transport to a small spot. The key physics issues are the degree of neutralization in the final ballistic drift region and potential beam aberrations in the magnetic lattice. We will present ion-trajectory calculations using the EGUN code to study the effect of spherical aberrations in the axisymmetric gun as well as 2D and 3D simulations using the particle-in-cell code WARP that takes into account the effect of geometric and fringe field aberrations and beam charge density nonuniformities in the final focus magnetic lattice.

This work was supported by the Director, Office of Science, Office of Fusion Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098 and Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.