

Abstract Submitted  
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**Warm fluid theory of a thermal rigid-rotor equilibrium for a charged particle beam in a periodic solenoidal focusing magnetic field<sup>1</sup>**

KSENIA SAMOKHVALOVA, JING ZHOU, CHIPING CHEN, MIT/PSFC — A warm fluid theory of a thermal rigid-rotor equilibrium for a charged particle beam in a periodic solenoidal focusing magnetic field is presented. Warm fluid equilibrium equations are solved in the paraxial approximation. The equation of state is obtained. The numerical algorithm for solving the self-consistent Poisson's equation is discussed. Density profiles are calculated numerically for low-intensity and high-intensity beams. Temperature effects in such beams are investigated.

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