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Analysis of a Simple Gyrotron Model H. WEITZNER, New York University-Courant Institute of Mathematical Sciences, M. GOETZ, R. MEYER-SPASCHE, Max-Planck Institute for Plasma Physics — A simple standard gyrotron model is studied. The model employs the paraxial approximation and involves only the axial coordinate as a space coordinate. The model contains a particle distribution function for the velocity in the perpendicular direction and is coupled to equations for the electromagnetic field. It is shown that there can be no blow-up of, or infinite gradients in, the fields or the distribution function. One can analyze the initial and final states under the assumption the tube has constant radius in those regions. When the final state is a pure plane wave one can characterize all final states dynamically accessible from the initial state. In many cases more than one final state is possible, although their number is not infinite. The description of the final state depends on a Hamiltonian formulation of the problem for the distribution function.

Harold Weitzner
New York University-Courant Institute of Mathematical Sciences

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