

Abstract Submitted
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Fundamental TE_{11} Mode and Plasma Interaction in a Cylindrical Waveguide SANJAY K. TOMAR, HITENDRA K. MALIK, Indian Institute of Technology Delhi — Microwave and plasma interaction has got applications in charged particle acceleration, travelling wave tube amplifiers, gyrotrons, etc. During the propagation of the microwave in a waveguide, it is seen that its wavelength gets larger if the plasma is filled in the waveguide, and also the field of the microwave gets altered. In addition, the plasma density distribution is modified. In the present work, we simulate the problem of this type of interaction by considering the fundamental TE_{11} mode and the plasma filled cylindrical waveguide. We assume that the fundamental mode encounters the plasma in another cylindrical waveguide of the same size. We derive a wave equation using Maxwell's equations for the microwave field along with the contribution of plasma and solve this by using fourth-order Runge-Kutta method. Then the perturbed density is studied in greater detail for the different profiles of the plasma density. The effect of electron temperature, waveguide radius, microwave field and its frequency are studied on the perturbed density that takes the form of bunches.

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