Low Frequency Whistler Waves Excited by Electron Beam in Homogenous Plasma

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Abstract—*The paper discusses the excitation of whistler waves in homogenous plasma by an electron beam. A dispersion relation for whistler waves is derived and a study of the energy transfer between the beam and the waves is done, when the phase velocity of the wave is comparable to the velocity of the beam. Expressions of growth rate are provided for Cerenkov and Doppler resonances and their dependence on beam density, plasma electron density and magnetic field is studied. The growth rate of the wave increases with beam density and is proportional to square root of the beam density.*

Keywords: *Whistler, frequency, dispersion, growth rate, Cerenkov, cyclotron.*