

Abstract Submitted
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Investigation of the effects of electron plasma frequency on the operation of a helix TWT¹ LUTFI OKSUZ, NECATI HAYTURAL, EMRE UYGUN, FERHAT BOZDUMAN, Suleyman Demirel University Department of Physics, HAKAN YESILTEPE, Suleyman Demirel University Department of Electronics and Communication Engineering, ALI GULEC, Suleyman Demirel University Biomedical Engineering — The oscillations of electrons are an important subject for the design procedure of linear beam tubes such as klystrons and TWTs. These oscillation frequencies may be affected by the finite region of the tube if the plasma wavelength of the electrons are larger than the bounding region of the device, leading to a reduced plasma frequency which further leads to an increase in wavelength [1]. Following the Pierce's theory on traveling wave tubes, it is seen that the reduced plasma frequency takes place in space charge terms which also include the Pierce's gain parameter C [2]. In this study the effects of plasma frequency on the operation of a helix TWT are investigated using CST Particle Studio. References: **1.** A.S. Gilmour Jr., "Klystrons, Traveling Wave Tubes, Magnetrons, Crossed-Field Amplifiers and Gyrotrons", Artech House, 1994 **2.** J.W. Gewartowski, H. A. Watson, "Principles of Electron Tubes", D. Van Nostrand Company, 1965

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