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Title:A Feasibility Study of Beam-Wave Interaction in 670 GHz Gyrotron for Radioactive Material Detection Application

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Abstract:In this article, a feasibility study of 300 kW RF power generation with TE_{25, 10} (transverse electric) operating mode for 670 GHz gyrotron is presented. The beam-wave interaction computation and power growth at fundamental harmonic are carried out by using the particle-in-cell code MAGIC. The beam current, beam voltage and magnetic field at cavity center are optimized for the efficient beam-wave interaction, which are 14 A, 70 kV, and 26.34 T, respectively. The parametric analysis is also carried out to provide the flexibility in the actual fabrication of the device. It is found that more than 300 kW power generation is possible at TE_{25, 10} operating mode. (C) 2012 The Japan Society of Applied Physics.

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