

496.

Author

Yuan XS. Lan Y. Ma CY. Han Y. Yan Y.

Title

Theoretical study on a 0.6 THz third harmonic gyrotron

Source

PHYSICS OF PLASMAS, vol.18, no.10, OCT 2011, 103115.

Abstract

A theoretical study on a 0.6 THz third harmonic TE(37) mode gyrotron oscillator is reported in this paper in order to develop a compact, reliable, and high power terahertz radiation source. An output power of 4 kW can be generated in the TE(37) mode (0.6 THz) at a resonant magnetic field of 7.86 T by the gyrotron oscillator operating at 55 kV/2 A with an electron beam radius of 0.32 mm. A magnetron injection gun (MIG) with high compression ratio has been designed. The simulation results of MIG show that the velocity ratio  $\alpha$  is 1.37, and the perpendicular velocity spread and parallel velocity spread are 6.1% and 8.9%, respectively. (C) 2011 American Institute of Physics.