42

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Title:Study of a 3rd-harmonic 0.6 THz gyrotron

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Abstract:Gyrotrons are high power millimeter-wave and terahertz radiation sources and have a broad range of applications to terahertz science and technology. The research of 0.6 THz gyrotron with an axis-encircling electron beam operating in the TE37 mode and third harmonic is presented according to the linear theory and nonlinear self-consistent theory of gyrotrons. And mode competition with the electron guiding center radii of 0 mm and 0.315 mm has been studied, respectively. The gyrotron operation at 55 kV beam voltage and 1A beam current can generate 4.73 kW output power at the frequency of 0.6 THz.

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Uncontrolled terms:Axis-encircling electron beam - Beam currents - Beam voltage -High-harmonics - High-power - Linear theory - Mode competition - Output power - Science and Technology - Tera Hertz - Terahertz radiation source - Third harmonic

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