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Title

Submillimeter planar gyrotrons with transverse diffraction output of radiation

Source

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Abstract

In order to increase the integral output power of short-wave gyrotrons, it is suggested to use a planar scheme with the transverse (relative to the direction of electron translation) diffraction output of radiation. An advantage of the planar design in comparison to the traditional cylindrical gyrotron geometry is the possibility to ensure the coherence of radiation at a greater oversized factor by using a diffraction mechanism of mode selection with respect to the transverse coordinate. The results of simulation of the nonlinear dynamics of a planar gyrotron with a polyhelical ribbon electron beam show that it is possible to reach an output power of several hundred kilowatt at frequencies up to 1 THz. An additional advantage of the proposed scheme is the possibility of frequency tuning by changing the distance between plates. (7 References).