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论文

# 强耦合双间隙微波谐振腔的特性分析

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摘要
该文设计了一类适合用于较低频波段宽带多注速调管的新型微波谐振腔——强耦合双间隙腔，并采用了较精确的三维电磁场模拟计算程序ISFEL3D对其各种主要参数和特性做了详尽的计算和理论分析，结果表明，强耦合双间隙微波谐振腔工作于π模时具有特性阻抗高而且体积小的突出优点，同时π模频率与2π模频率的间隔明显增大。另外，该文还利用两种常用的集总元件等效电路对计算数据和结论进行验证，并对两种常用的等效电路的精确度做了讨论。

关键词 强耦合双间隙腔 宽带多注速调管 π模和2π模 缝模 特性阻抗 集总元件等效电路

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# An analysis of the characteristics of strongly coupling two-gap microwave cavities

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Abstract
A new kind of microwave cavity-strongly coupling two-gap cavities, which can be used in broadband multi-beam klystrons that work in lower frequency band, is designed in this paper. The important parameters of the cavity are calculated with ISFEL3D, a reliable program for solving three dimension electric-magnetic field problems, and the characteristics of this kind of cavity are analyzed carefully. It is showed that strongly coupling two-gap cavities have some prominent virtues, such as higher characteristic resistance and smaller volume when they work in tt mode. Besides, the frequency interval of n mode and 2tt mode is much wider. Furthermore, two kinds of concentrated element equivalent circuits are used in this paper to prove the calculated data and conclusions, meanwhile the precision of two equivalent circuits is discussed.

Key words Strongly coupling two-gap cavity Broadband multi-beam klystron π mode and 2π mode Slot mode Characteristic resistance Concentrated element equivalent circuit

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