Abstracts

Design and analysis of a coaxial coupler for a 35-GHz gyroklystron amplifier

A.H. McCurdy and J.J. Choi. "Design and analysis of a coaxial coupler for a 35-GHz gyroklystron amplifier." 1999 Transactions on Microwave Theory and Techniques 47.2 (Feb. 1999 [T-MTT]): 164-175.

A single rectangular TE/sub 10/ feed four-slot coaxial coupler is designed and built for excitation of a TE/sub 011/ cylindrical cavity mode for use in high-power millimeter-wavelength gyroklystron amplifiers. A high degree of mode purity is obtained and matching of the cavity to the input line is studied. A model based on the mode-matching technique and dipole radiators has been formulated to predict operation of this coupler. The resulting numerical code is capable of finding resonant frequency and cavity bandwidth in a small fraction of the time taken by more general finite-difference/finite-element design tools. The model can be extended to self-consistently include an electron beam, and the model is compared to a coupler design based on Hewlett-Packard's High-Frequency Structure Simulator code. The coupler has been successfully used in a high-power gyroklystron-amplifier experiment.

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