Abstracts

Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron

In this paper the theoretical performance of two nonlinear circular waveguide tapers constructed for a 10 GHz, 30 MW amplifier utilizing the lowest circular electric mode is evaluated. Mode coupling is estimated with a code that solves the generalized telegraphist's equations numerically and is compared with the results of a cascaded scattering matrix code. It is found that assuming a sufficiently lossy conducting boundary allows evaluation of modes that pass through cutoff and that consideration of backward modes usually results in small changes in the forward modes that reconcile the two numerical procedures. A comparison of the raised cosine profile with other taper shapes is made.

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