Abstracts

Coupled-Mode Description of Crossed-Field Interaction

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The coupled-mode theory is developed for two-dimensional M-type flow, and a system of five coupled-mode equations is obtained. A fifth degree secular equation is found for the perturbed propagation constants of the system. Under weak space-charge field conditions, both the forward-wave and backward-wave interactions may be described in terms of only two coupled modes. The two-mode theory is applied to the calculation of starting conditions for the M-BWO, and to the M-FWA. The conditions for beating-wave amplification are determined, and the variation of the mode amplitudes with distance is given.

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