Abstracts

Perturbation Theorems for Waveguide Junctions, with Applications (Feb. 1966 [T-MTT])

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Perturbation theorems are derived in the context of a theory of waveguide junctions. These theorems express changes in impedance or admittance matrix elements, due to changes in a waveguide junction, in terms of integrals over products of perturbed and unperturbed basis fields associated with the junction and with its adjoint. Media involved are required only to be linear. Concepts of first-order perturbation theory are discussed briefly, and the term "correct to the lowest order" is precisely defined. The need of explicit theorems telling when one may expect results actually correct to the lowest order is noted. Two problems are solved approximately by the perturbation approach: i) reflection at the junction of rectangular waveguide with filleted waveguide of the same main dimensions; and 2) the effect of finite conductivity of both obstacle and waveguide wall for half-round inductive obstacles in rectangular waveguide.

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