Abstracts

Calculation of Radiation Fields in Waveguides by a Principle of Power Balance

I. Kaufman. "Calculation of Radiation Fields in Waveguides by a Principle of Power Balance." 1970 Transactions on Microwave Theory and Techniques 18.8 (Aug. 1970 [T-MTT]): 418-425.

A simple formula is derived for calculating the amplitude of the field that is due to an elemental radiator which radiates into a particular waveguide mode. The method used is based on rather elementary principles, and appeals readily to physical intuition. In this technique, the field radiated into an infinite-length waveguide is obtained from the expression for the field developed by the radiator in a traveling wave resonator formed of this waveguide, where this expression is found by use of the Poynting theorem. While derived for the electromagnetic system, the method and formula can be applied to other waveguide systems, such as mechanical, mixed, or others. Several examples are given to illustrate the use of the method.

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