Abstracts

Systematic Searching for Cavity and Waveguide Modes by Making Use of Foster's Theorem

Resonance and irrotational cavity modes as well as waveguide eigenmodes are usually determined numerically (except for a few structures whose solutions are analytically known). Most of the methods of analysis end up at a determinental equation, the zeros of which characterize these modes. Numerically overlooking some of these zeros is one of the problems which greatly degrade the accuracy of a field expansion in terms of the corresponding modes. In this contribution it is shown that it is always possible to find a reactance (or susceptance) function having the same set of zeros as the original determinental equation. This enables making use of Foster's theorem to systematically determine these zeros.

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