Abstracts

The theory of surface-wave and space-wave leaky-mode excitation on microstrip lines

F. Mesa, C. Di Nallo and D.R. Jackson. "The theory of surface-wave and space-wave leaky-mode excitation on microstrip lines." 1999 Transactions on Microwave Theory and Techniques 47.2 (Feb. 1999 [T-MTT]): 207-215.

This paper discusses the excitation and physical validity of both surface-wave and space-wave leaky modes on microstrip lines. This is done by analyzing the discrete modal spectrum excited by a realistic source on or near an infinite microstrip line. A semi-analytical three-dimensional (3-D) Green's function is used for this purpose, which provides the current excited on the conducting strip due to the source. The 3-D Green's function is in the form of a spectral integration (inverse Fourier transform) in the longitudinal wavenumber plane. The poles of the integrand directly determine the excitation amplitudes of the modes on the structure that are launched by the source. The integrand also has different types of branch points, and the location of the poles on the various Riemann sheets is used to determine the physical significance of the leaky modes. Although the theory presented here is illustrated for a microstrip line, the conclusions apply in general to open printed-circuit structures.

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