Abstracts

Simultaneous Propagation of Bound and Leaky Dominant Modes on Printed-Circuit Lines: A New General Effect (1995 Vol. I [MWSYM])

H. Shigesawa, M. Tsuji and A.A. Oliner. "Simultaneous Propagation of Bound and Leaky Dominant Modes on Printed-Circuit Lines: A New General Effect (1995 Vol. I [MWSYM])." 1995 MTT-S International Microwave Symposium Digest 95.1 (1995 Vol. I [MWSYM]): 145-148.

We were the first to report (at the 1993 IEEE International Microwave Symposium) that both the bound and leaky dominant modes can propagate simultaneously on conductor-backed coplanar strips over a frequency range. We have recently studied this interesting and initially unexpected effect in more detail, and we have made two important discoveries: (1) The simultaneous-propagation effect can actually occur on most printed-circuit transmission lines (its presence depending on the relative line dimensions), so that, contrary to earlier belief, the effect is rather general. (2) We have discovered the surprising presence of a new improper (or nonspectral) real solution, which is nonphysical but whose evolution as a function of dimensional change serves to explain how the simultaneous-propagation effect can occur. The new solution, and its behavior in a completely nonphysical region, thus govern otherwise-mysterious large changes in the physical, measurable solutions.

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