Abstracts

High-frequency leaky-mode excitation on a microstrip line

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The excitation of leaky modes (LMs) and the continuous spectrum (CS) on a microstrip line at high frequencies from a delta-gap source is studied. The delta-gap source models a practical source or discontinuity on the line. It is shown that the current excited from the source exhibits spurious effects at high frequencies due to the excitation of the CS (radiation spectrum), which may or may not be dominated by a physical LM, depending on the frequency range and the substrate permittivity. In some cases, the spurious effects are due to a physical LM, while in other cases the effects are due to the excitation of one or more "residual-wave" (RW) currents, which have not been previously studied for open microstrip lines. There are two types of RW currents: a free-space type and a surface-wave type. Depending on the frequency and the structural parameters, either of these may be the more dominant. At certain frequencies, weakly attenuated high-order LMs may also be excited, in which case spurious effects are observed out to large distances from the source.

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