Abstracts

Radiation Modes of Open Microstrip with Applications

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The well known bound modes of open microstrip do not constitute a complete spectrum, for, continuous radiation and localized (reactive) modes are excited at discontinuities in microstrip circuits and antennas. This part of the spectrum has not been investigated before so that, up to date, radiation problems in microstrip are being investigated by nonmodal methods, such as the moment method. We derive here for the first time the complete spectrum of open microstrip, including one or more bound modes and a continuum, and demonstrate its straightforward application to a practical problem such as the excitation by a cylindrical probe of finite radius. Application of Lorentz's reciprocity principle is now possible in complete analogy to the problem of excitation of a close waveguide by a probe. Mode patterns, the equivalent circuit of a via-hole and its radiation pattern are characterized as a practical application of the foregoing theory.

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