Abstracts

Analysis of the propagation and leakage effects for various classes of traveling-wave sources in the presence of covering dielectric layers

C. Di Nallo, F. Frezza, A. Galli and P. Lampariello. "Analysis of the propagation and leakage effects for various classes of traveling-wave sources in the presence of covering dielectric layers." 1997 MTT-S International Microwave Symposium Digest 2. (1997 Vol. II [MWSYM]): 605-608.

The fundamental perturbation effects on the propagation properties (phase and leakage constants) of traveling-wave sources due to the presence of covering dielectric layers with arbitrary permittivity and dimensions are investigated in this work. Our analysis is applicable to several well known and used classes of leaky-wave antennas (slotted rectangular guide, stub-loaded, ridge, stepped, and so forth) when radomes are required for environmental protection. The basic step is given by the quantification of the radiation admittance for the aperture of the coated single-line source via a spectral-domain approach. Through usual transverse resonance techniques, from the straightforward calculation of the phase and leakage constants it is then possible to easily characterize the global radiation properties. Extensions to the case of coated arrays are also carried out. The results show the type and the amount of the modifications that are related to the introduction of radomes in traveling-wave antennas.

❑ Return to main document.