Abstracts

Scattering by an infinite elliptic dielectric cylinder coating eccentrically a circular metallic or dielectric cylinder

S.P. Savaidis and J.A. Roumeliotis. "Scattering by an infinite elliptic dielectric cylinder coating eccentrically a circular metallic or dielectric cylinder." 1997 Transactions on Microwave Theory and Techniques 45.10 (Oct. 1997, Part I [T-MTT]): 1792-1800.

In this paper, the scattering of a plane electromagnetic wave by an infinite elliptic dielectric cylinder, coating eccentrically a circular metallic or dielectric inner cylinder, is treated. The electromagnetic field is expressed in terms of both circular and elliptical-cylindrical wave functions, which are connected with one another by well-known expansion formulas. Translational addition theorems for circular cylindrical wave functions are also used. If the solution is specialized to small values of h=k/sub 2/c/2, where k/sub 2/ is the wavenumber of the elliptic dielectric cylinder and c its interfocal distance, semianalytical expressions of the form S(h)=S(0)[1+gh/sup 2/+O(h/sup 4/)] are obtained for the scattered field and the various scattering cross sections of this configuration. The coefficients g are independent of h. Both polarizations are considered for normal incidence. Graphical results for the scattering cross sections are given for various values of the parameters.

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