Abstracts

Interaction of Electromagnetic Waves with General Bianisotropic Slabs

J.L. Tsalamengas. "Interaction of Electromagnetic Waves with General Bianisotropic Slabs." 1992 Transactions on Microwave Theory and Techniques 40.10 (Oct. 1992 [T-MTT]): 1870-1878.

In a number of recent papers an efficient, elegant and systematic formulation technique has been developed which, combining Fourier transform with matrix analysis methods, was found to be quite suitable for problems related to radiation by dipole or other sources in the presence of an arbitrarily general stratified anisotropic medium. In the present paper this technique is adapted and further extended so as to allow the presence of general bianisotropic media described by four tensors with no limitations on their elements. Two specific applications pertaining to some canonical problems of fundamental importance are included to exemplify the method and demonstrate its usefulness. Considered here are: a) radiation by an arbitrarily oriented elementary electric dipole source located in the vicinity of a general bianisotropic slab, either grounded or ungrounded, leading to the expressions of the dyadic Green's function of the structure, and b) reflection and transmission of an arbitrarily polarized plane wave incident upon such a slab, leading to closed-form concise expressions for the reflection and transmission coefficient matrices. These derivations may serve as a basis for formulating and solving numerous propagation, radiation and scattering problems for planar structures which use such materials as substrates.

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