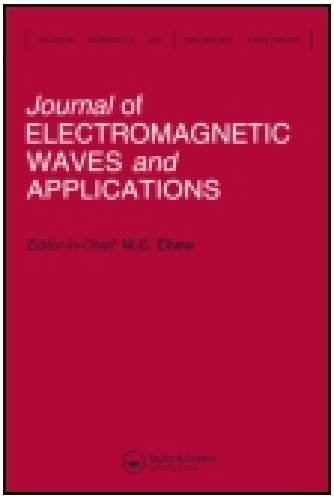

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Dyadic Green's Functions in Multilayered Stratified Gyroelectric Chiral Media - Abstract

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DYADIC GREEN'S FUNCTIONS IN MULTILAYERED STRATIFIED GYROELECTRIC CHIRAL MEDIA — Abstract*

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Abstract—To characterize electromagnetic waves in complex media has been an important topic because of its useful applications and scientific significance of its physical mechanism. Dyadic Green's functions, as a mathematical kernel or a dielectric medium response, relate directly the radiated electromagnetic fields and the source distribution. In terms of the vector wave functions in cylindrical coordinates, dyadic Green's functions in a unbounded and a planar, multilayered gyroelectric chiral media are formulated. By use of the scattering superposition principle and taking the multiple reflections into account, a general representation of the Green's dyadics is obtained. Furthermore, the scattering coefficients of the Green's dyadics are determined from the boundary conditions at each interface and are expressed in a greatly compact form of recurrence matrices. In the formulation of the Green's dyadics and their scattering coefficients, three cases are considered, i.e., the current source is impressed in (1) the first, (2) the intermediate, and (3) the last regions, respectively. Although the dyadic Green's functions for a unbounded gyroelectric chiral medium has been reported in the literature, some of the results are incorrect. As compared to the existing results, the current work basically contributes (1) a correct form of dyadic Green's function for a unbounded gyroelectric chiral medium, (2) the general representation of the dyadic Green's functions for a multi-layered gyroelectric chiral medium, and (3) a convincible and direct derivation of the irrotational Green's dyadic.

* The complete text appears in *Progress In Electromagnetics Research.*

Le-Wei Li See Page 1664.

Siew-Bee Yeap received B.Sc. degree in Physics (with upper 2nd class honors) from University Malaya, Malaysia in 1996, and M.Sc. degree in electrical engineering from National University of Singapore in 1998. She is now pursuing Ph.D. degree studies in electronic engineering at the Queen Mary College, University of London. Her current interest is on development of the dyadic Green's functions using the eigenfunction expansion in anisotropic media and applications of such Green's functions.

Mook-Seng Leong See page 1665.

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Pang-Shyan Kooi See page 1666.