Abstracts

Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations

M. Guglielmi and A.A. Oliner. "Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 534-541.

In Part I of this set of two papers, the problem of a plane wave incident at an arbitrary angle on a metal-strip grating of arbitrary period located at an air-dielectric interface is formulated rigorously in terms of a pair of "static" integral equations, from which new equivalent multimode network descriptions are derived. Both aperture and obstacle approaches are treated, and both TE and TM polarizations are considered explicitly. In Part II we present two approximate, but very simple and accurate, analytical solutions of the relevant integral equations, which in turn lead to simple and useful multimode network descriptions of the discontinuity. Several numerical comparisons are also presented between the results obtained using these new simple networks and those from an independent numerical reference solution. Excellent agreement is found over a fairly large range of parameter values.

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