Abstracts

A Note Concerning Modes in Dielectric Waveguide Gratings for Filter Applications (Short Papers)

G.L. Matthaei. "A Note Concerning Modes in Dielectric Waveguide Gratings for Filter Applications (Short Papers)." 1983 Transactions on Microwave Theory and Techniques 31.3 (Mar. 1983 [T-MTT]): 309-312.

Peng and Oliner, and others have shown that TM-to-TE or TE-to-TM mode conversions occur when a single, lowest order surface wave is incident obliquely onto a wide dielectric grating and that the lowest order converted modes of this sort can cause spurious stopbands which are especially troublesome because they are so close to the desired stopband, In this note it is observed that the spurious response situation is not as bad in the case of a grating cut into a dielectric waveguide (which can be thought of as having two, obliquely incident waves present). In this latter case, the fields have even or odd symmetry which eliminates part of the mode couplings includhrg the lowest order TM-to-TE or TE-to-TM couplings. Experimental and theoretical results indicate that gratings can be made to be free from spurious responses or appreciable radiation over sizeable bands so that they can be useful in at least some kinds of dielectric waveguide filter structures.

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