Abstracts

Diffraction Efficiencies for Infinite Perfectly Conducting Gratings of Arbitrary Profile

Integral equations are obtained for the currents induced on an infinite perfectly conducting grating by a plane wave. The integral equations are approximated by matrix equations which are readily solved for the currents. Once the currents are known one can obtain the strengths of the grating modes. Numerical results are obtained for specific cases which have been considered previously in some optical experiments by Madden and Strong. The theoretical results are consistent with the conservation of energy. However, there are discrepancies with the experimental results. An equivalent problem of reflections in a terminated waveguide is also considered and good agreement between theory and experiment is obtained. The technique is extendible to dielectric gratings.

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