Abstracts

Distribution of current induced on metal-strip gratings by plane wave

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In this paper, we present a rigorous analysis of current distribution induced on a metal-strip grating by an incident plane wave. The metal strips of the grating are characterized by a complex permittivity, with a large imaginary part to account for their finite conductivity. Such a scattering problem is formulated by the mode-matching method to determine the scattered fields everywhere, so that the volume distribution of current within a metal strip can be explicitly obtained. Numerical results are given to illustrate the effects of the dielectric constant of the surrounding media, as well as the incident angle and polarization on the current distribution induced by an incident plane wave. The air and metal modes form the basis for physical explanations of the numerical results obtained.

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