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Diffraction by a Metallic Edge Near Plasma Frequency MIGUEL A. ALVAREZ-CABANILLAS, National Polytechnic Institute, CITEDI — The behaviors of the fields diffracted by a metallic half-plane near plasma frequency are obtained. Incident plane wave with transverse magnetic polarization TM is diffracted by a gold sheet. The size of the atoms and the interatomic distance in the metallic sheet are assumed to be smaller than the wavelength. The electromagnetic field cannot detect the inner structure of the system and thus observes a homogeneous structure of the medium. These justify the use of a semi-classic theory and quantum effects will not be included. In this limit, the permittivity and the permeability are valid concepts. Finite difference time domain FDTD approach is applied to solve the Maxwell equations, PML as absorbing boundary conditions and a conductor as gold for the half-plane diffractor. Auxiliary Differential Equation method ADE is implemented in the FDTD to consider the nonlinear dispersion behavior of the metallic sheet near the plasma frequency. As results, the diffraction behavior near the plasma frequency by the wave-electron effect is shown; as the dependence of the diffracted fields with the longitude of the thickness of the metallic half-plane.

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