

## UNIFORM EVALUATION OF THE SURFACE WAVE DIFFRACTION BY AN IMPEDANCE WEDGE AND ITS APPLICATION TO A STRIP

M. I. Herman and J. L. Volakis  
Radiation Laboratory  
Department of Electrical Engineering and Computer Science  
The University of Michigan  
Ann Arbor, Michigan 48109

Previous uniform solutions for the diffraction by an imperfectly conducting wedge (R. Tiberio, IEEE Trans., AP-S, 33, 867-873, 1985) have not included a uniform evaluation of the surface wave contribution which can be rather significant when it exists. In this presentation a method will be discussed for the derivation of a uniform diffraction coefficient including the surface waves. This technique first involves the subtraction and addition of each singular term in the diffraction integral (P. C. Clemmow, The Plane Wave Spectrum Representation of Electromagnetic Fields, Pergamon, Press, 1966). The integrand is thus subdivided into singular and non-singular parts. The integrals associated with the singular terms are evaluated exactly and the remaining are evaluated asymptotically. In most cases the contribution of the latter terms are negligible. It is further noted that the above procedure is rather general and can be applied to cases where several singularities may exist.

The above solution is applied to the scattering analysis of a thin dielectric strip by considering only the electric current contributions associated with the impedance half plane (T.B.A. Senior, Rad. Sci., 10, 645-650, 1975). In this analysis all surface wave contributions due to edge interactions are included in a self-consistent manner and a slope diffraction component is included. Results obtained compared favorably with the moment method solution (J. H. Richmond, IEEE Trans. AP-S, 33, 64-68, 1985).