UNIFORM DIFFRACTION COEFFICIENTS FOR AN IMPEDANCE HALF-PLANE

J. L. Volakis and T.B.A. Senior
Radiation Laboratory
Department of Electrical Engineering and Computer Science
The University of Michigan
Ann Arbor, Michigan 48109

Uniform diffraction coefficients will be presented for the cases of normal and oblique incidence on a half-plane edge associated with impedance boundary conditions. These coefficients are based on the Weiner-Hopf solution by Senior (Radio Science, 1975). Numerical results will also be presented using such uniform solutions.

The dominant parts of the diffraction coefficient are put in a form compatible with the corresponding uniform coefficients for a conducting edge. They are then examined in detail, especially at the shadow and reflection boundaries. At these boundaries, a direct comparison can be made with existing heuristic coefficients. Not surprisingly, the coefficients involve the appropriate split functions of the Weiner-Hopf solution which can be expressed in terms of the Maliuzhinets moromorphic function. In case of real impedances, a simple analytical expression will be given for this function.

The results at normal incidence, using the above uniform solution, are in agreement with recently published patterns employing more involved diffraction coefficients (Tiberio, etc., AP-S/URSI Symposium, 1984). Scattering patterns will also be presented at oblique incidences with real and complex impedances. Finally, a generalization of these coefficients to the case of wedges will be discussed.