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Point source diffraction from a semi-infinite perfect electromagnetic conductor half plane

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Abstract: The Wiener-Hopf (WH) technique is employed to study the problem of spherical wave diffraction (emanating due to a point source) from a semi-infinite perfect electromagnetic conductor (PEMC) half plane. The importance of the PEMC solution is due to the fact that: (i) it is the generalization of both perfect electric conductor (PEC) solution and perfect magnetic conductor (PMC) solution, (ii) the reflected electromagnetic wave from a PEMC boundary has cross polarized component in addition to the co-polarized component. Some graphs showing the effects of various parameters on the diffracted field are plotted and discussed.

Keywords: Diffraction, Point source, WH technique, PEMC plane, Far field approximation.

1 Introduction

Poincare and Sommerfeld were seem to be first to investigate the half plane diffraction problem of electromagnetic waves which was formulated as the boundary value problem for Maxwell equations. The generalization of the works of Poincare and Sommerfeld from the half plane to the case of perfectly conducting wedge was contributed by Keller and Blank, Oberhettinger and Roseau [1]. Paper considering the large but finite conductivity of the dielectric wedge may be credited to Jones and Pidduck [2], Felson [3], Karp and Karal [4] and Williams [5]. Jones and Pidduck [2] also observed that for the analysis of general theoratical diffraction problem of electromagnetic waves falling on the mass of dielectric bounded

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