
STUDY OF ELECTROMAGNETIC WAVE SCATTERING FROM AN IMPEDANCE COATED STEP IN A COAXIAL WAVEGUIDE

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ABSTRACT

Propagation and scattering problems of electromagnetic waves are encountered in various fields such as communication and radar systems, antenna applications, microwave filters. Therefore, there is a growing need to examine the scattering of electromagnetic waves from such structures with analytical methods. In this work, mathematical analysis of the propagation of the TEM wave from a coaxial waveguide with an impedance coated step discontinuity on its inner conductor is carried out by applying the Mode-Matching technique. In this method, a linear algebraic equation system consisting of infinite equations with infinite unknowns is obtained and this system is truncated at an appropriate truncation number. Finally, the reflected and transmitted fields are achieved.

Keywords Boundary-Value Problems · Wave Propagation · Mode-Matching Technique

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