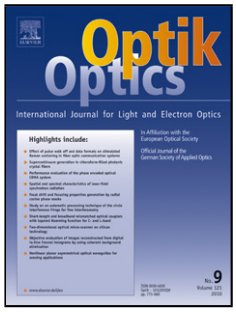

Title: Asymptotic Boundary Conditions Analysis of a Conducting Strips Loaded Chiral Circular Cylinder in Chiral Medium

Author: Sobia Shoukat Shakeel Ahmed Aqeel A. Syed Qaisar A. Naqvi

PII: S0030-4026(17)30052-9
DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2017.01.040
Reference: IJLEO 58743

To appear in:

Received date: 10-12-2015
Accepted date: 16-1-2017

Please cite this article as: Sobia Shoukat, Shakeel Ahmed, Aqeel A. Syed, Qaisar A. Naqvi, Asymptotic Boundary Conditions Analysis of a Conducting Strips Loaded Chiral Circular Cylinder in Chiral Medium, *<![CDATA[Optik - International Journal for Light and Electron Optics]]>* (2017), http://dx.doi.org/10.1016/j.ijleo.2017.01.040

Asymptotic Boundary Conditions Analysis of a Conducting Strips Loaded Chiral Circular Cylinder in Chiral Medium

December 10, 2015

Sobia Shoukat, Shakeel Ahmed, Aqeel A. Syed, Qaisar A. Naqvi
Department of Electronics, Quaid-i-Azam University Islamabad
Pakistan.

Abstract

An analytical solution to study the scattering of electromagnetic plane wave from an infinitely long circular cylinder loaded with conducting helical strips is presented. The region outside the cylinder is occupied by free space/chiral medium. The spacing between the strips is assumed to be negligibly small as compared to incident wavelength. Cylindrical vector wave functions are used to assume the solution in terms of unknowns coefficients. Asymptotic strip boundary conditions are imposed to incorporate the contribution of interface and strips, simultaneously. Numerical results for the scattering echo-width are presented to highlight the effects due to loading the strips on chiral circular cylinder. Reduction in scattering echo-width of strips loaded chiral circular cylinder is useful to reduce the visibility of object at the observation point. Occurrence of same values of co- and cross scattering echo-width of strips loaded chiral cylinder for multiple values of radius may also be considered useful for hiding of object information. Special cases are also discussed for the validation of results.

1 Introduction

Chiral medium can be constructed from numerous randomly oriented chiral elements by embedding them in dielectric host medium. The chiral elements are