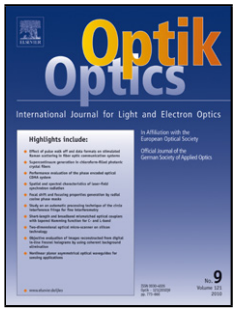

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PII: S0030-4026(16)30681-7
DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2016.06.059
Reference: IJLEO 57845

To appear in:

Received date: 28-2-2016
Revised date: 9-6-2016
Accepted date: 11-6-2016

Please cite this article as: Musarat Abbas, Azhar Abbas Rizvi, Qaisar Abbas Naqvi, Two Dimensional Green's Function for Non-integer Dimensional Dielectric Half Space Geometry, *<![CDATA[Optik - International Journal for Light and Electron Optics]]>* (2016), http://dx.doi.org/10.1016/j.ijleo.2016.06.059

Two Dimensional Green's Function for Non-integer Dimensional Dielectric Half Space Geometry

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Abstract

Two dimensional Green's function for non-integer dimensional dielectric half space geometry has been derived. It has been assumed that both half spaces are of non-integer dimension. Radiated fields are written as unknown spectrum of plane waves for non-integer dimensional space. Unknown spectrum functions are derived using the boundary conditions. Special cases with one of the two or both half spaces taken as integer dimensional have also been addressed.

Key Words: Non-integer dimensional space, Two dimensional Green's function, Dielectric half space, Fractal medium

1. Introduction

In scientific literature, the term continuum medium is used when matter is continuously distributed and occupies the whole region of the space. Treating medium in this way ignores the gaps present in the medium, e.g., the inter-atomic separations. This assumption works very well to explain many physical phenomena on length scales much greater than the gap size or inter-atomic distance. Analysis based on continuum