سیویلیکا - ناشر تخصصی مقالات کنفرانس ها و ژورنال ها
گواهی ثبت مقاله در سیویلیکا
CIVILICA.com

عنوان مقاله:

Extraction of Electromagnetic Scattering from Random Rough Surfaces in Complex Environments using Numerical Methods

محل انتشار:

دوفصلنامه مهندسی مخابرات, دوره 10, شماره 1 (سال: 1402)

تعداد صفحات اصل مقاله: 12

نویسندگان:

Amir Hatamian - *Department of Electrical Engineering, Urmia University, Urmia, Iran*

Changiz Ghobadi - *Department of Electrical and Computer Engineering Urmia University, Urmia, Iran*

Javad Nourinia - *Department of Electrical and Computer Engineering Urmia University, Urmia, Iran*

Ehsan Mostafapour - *Urmia University*

Rahim Barzegari - *Department of Electrical Engineering, Urmia University, Urmia, Iran*

خلاصه مقاله:

In this study, we present a comprehensive overview of the exact and approximate models and methods that are available to measure the dispersion of random rough surfaces. We investigated the structural implementation of such surfaces in the finite-difference time-domain (FDTD) simulation environment and introduced a method for error reduction in simulated environments with such surfaces to improve the accuracy of near-path scattering of random rough surfaces. For this aim, a new adsorbent consisting of two types of adsorbents with distinct properties is proposed. During different tests in environments with the random rough surfaces and more complex environments with abnormal dispersers, the superiority, and higher performance of the proposed adsorbents are verified and then, properties of the adsorbents are investigated. Next, two dimensional random rough surfaces are analyzed to investigate electromagnetic scattering. To determine the electromagnetic scattering field, surface height's and slope's joint probability density function is calculated and utilized after generating a two-dimensional rough surface. The ray-tracing base model is exploited, and then the Monte-Carlo technique is hired to convert an infinite integration form into .the form of finite integration

کلمات کلیدی:

Absorbent layers, Random rough surface scattering, Finite-difference time-domain (FDTD) numerical method, Numerical methods in electromagnetism

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1617816