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无限大金属平板上开有二维周期性孔阵的散射特性分析

沈忠祥, 华荣喜

南京航空学院401教研室 南京 210016

ANALYSIS OF THE SCATTERING CHARACTERISTICS BY A CONDUCTING SCREEN PERFORATED PERIODICALLY WITH APERTURES

Shen Zhong-xiang, Hua Rong-xi

Faculty 401 of Nanjing Aeronautical Institute, Nanjing, 210016

摘要

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摘要 本文利用矩量法分析了无限大金属平板上开有二维周期性孔阵的电磁散射特性。通过引入广义波导的概念,可以统一分析孔径形状为任意的这类频率选择表面。作为示例,分别计算了无限大平板上开有矩形、圆形和等边三角形孔阵的散射特性。结果与现有文献中给出的数据极为一致。

关键词: 电磁散射 频率选择表面 矩量法

Abstract: In this paper the scattering characteristics of a plane wave incident on a thin perfectly conducting screen perforated periodically with apertures are analysed by the method of moments. The concept of generalized waveguide is introduced, and each element of this kind of frequency selective surface (FSS) can be taken as a junction between two generalized waveguides. The eigen modes in these waveguides are replaced by Floquet modes in periodic structures. An equivalence theorem and the method of moments are employed to obtain the generalized scattering matrix of the junction. As an example, the scattering from a conducting screen perforated periodically with rectangular, circular and equilateral triangular apertures are computed, respectively. Numerical results show good agreement with those published in available literature.

Keywords: electromagnetic scattering frequency selective surfaces (FSS) the method of moments

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