

On problems of electromagnetic wave diffraction on periodical sets of heterogeneities in the layered media

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Abstract

The universal approach to solving the diffraction problems on the periodical set of heterogeneities in the layered media is proposed. The infinite periodic grating consisting of thin conducting bands embedded into a dielectric plate is considered as an example. At first, it is advisable to solve the auxiliary diffraction problem in the case when the heterogeneities are moved off. The heterogeneities generate the field perturbation; it is a solution of a similar pair equation. Secondly, we need to define new unknown variables in such way that the pair equation should have the standard form. To get this result we propose to use the boundary value conditions on the heterogeneities. The dual equation is equivalent to regular infinite set of linear equations for the Floquet coefficients. In some case the wave diffraction problems on the periodical sets of heterogeneities can be reduced to vector dual summatorial functional equations. © 2012 IEEE.

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