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Over-determined boundary value problems for PDE and their application in the wave propagation theory

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Abstract

© 2014 Taylor & Francis. The solvability conditions of the over-determined boundary value problems for PDE with constant coefficients in the form of connection between Fourier transforms of boundary functions are obtained. The jump problem on the hyperplane for PDE is formulated and investigated. Two-dimensional Helmholtz equation is considered as an example. It is proved that the mixed type conjugation problem for Helmholtz equation, to which the diffraction problem of the electromagnetic wave on thin conducting ribbons is reduced, is equivalent to one-sided mixed type boundary value problem. The uniqueness theorem is proved for this problem.

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Keywords

diffraction problem, Fourier transform, Helmholtz equation, over-determined problems