

# *Bounds for Solutions of a System of Partial Differential Equations*

STEFAN BERGMAN

## 1. Introduction.\*

The deep insight into the theory of harmonic functions obtained from the connection between them and analytic functions of a complex variable stimulates us to extend this approach for the study of other linear partial differential equations. The question of generalization of these methods to the case of functions of two variables satisfying linear partial differential equations is one of the problems which arises in this connection. Equations in two variables and with entire coefficients have been investigated from this point of view in a number of papers (see [1, 2, 3, 4]). In particular, in this case various integral operators transforming analytic functions of a complex variable into solutions of these equations have been defined, and various properties of solutions of equations mentioned above have been established. These investigations showed that there exist *various* operators generating solutions of the same equation and that for various purposes it is convenient to use different operators.

It is natural to attempt to extend this approach to differential equations and systems of differential equations in three and more variables. The attempts in this direction show that a still greater variety of operators appear and that the research requires not merely a technical improvement in those used in the case of two variables. In many instances we have to introduce and develop completely new procedures, having no analogy in the cases of the differential equation in two variables.

The theory of systems of partial differential equations which can be connected with analytic functions of two complex variables by using conveniently chosen operators seems of particular interest in this respect. In a recent paper [5], SCHIFFER and the author derived an integral operator transforming certain

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