

REMOVABLE SINGULARITIES OF SOLUTIONS OF SYSTEMS OF LINEAR DIFFERENTIAL EQUATIONS

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The purpose of this note is to prove theorems on removable singularities of hyperfunction solutions and real analytic solutions of systems of linear differential equations.

It is Ehrenpreis [1] who first showed that any "overdetermined" system of linear differential equations with constant coefficients presents the Hartogs' phenomenon concerning removable singularities of solutions, which is clearly one of the most interesting phenomena in the theory of holomorphic functions of several complex variables. Professor Ehrenpreis also raised a question whether overdetermined systems of linear differential equations with variable coefficients enjoy such a property or not (private communication), and this note gives an affirmative answer to his question in the case of a one point singularity (Theorem 1 below).

We also present the following new phenomenon concerning the extension of real analytic solutions of a system of linear differential equations with variable coefficients:

It may happen that the singularity of a hyperfunction solution is uniquely removable but that an analytic solution cannot be extended as an analytic solution. See Theorem 3 for the precise statement.

It should be emphasized that such a phenomenon can never be observed in the case of systems with constant coefficients.

The details of the proof and the further development of the results of this note shall be given elsewhere.

We use the same notation as Sato-Kawai-Kashiwara [4] unless otherwise stated.

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