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10. Partial Differential Equations

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Riemann problem related to the Shilov boundary

The problem is to find analytic functions in related domains by the given date on the Shilov boundary. This problem faces some tough difficulties: (1) zero set of analytic functions of several complex variables can be connected and this paralizes the index method; (2) there is no any convincible analogue of the Plemelj - Schokotskii formula in higher dimension and it makes impossible to construct the canonical function; (3) the connection between the Riemann problem and the Riemann - Hilbert problem was lost. Applying the method of Fourier series and analysing the structure of analytic functions we have been able to treat the problem in Wiener algebra. The solution is given explicitly.

Reference : H. Begehr and G. C. Wen, Nonlinear elliptic boundary value problems and their applications, *Addison Wesley Longman 1996.*