

SIMULTANEOUS RECONSTRUCTION OF COEFFICIENTS AND SOURCES PARAMETERS IN STRONGLY ELLIPTIC SYSTEMS MODELLED WITH OVER SPECIFICATION OF CAUCHY DATA AT BOUNDARY

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Resumo/Abstract:

The inverse problem for determination of parameters related to the support and/or functions describing the intensity of coefficient and sources in models based on strongly elliptic second order systems is posed with Cauchy data over specification at boundary. This establishes a set of various boundary value problems associated with the same group of unknown parameters. A Lipschitz boundary dissection is used for decomposing each Cauchy data into pairs of complementary mixed boundary value problems. The concept of Calderon projector gap is introduced as a tool to check the consistency of the Cauchy data and to demonstrate the equivalence of these two problems. This lets you define a discrepancy function to measure the distance between the solutions of problems obtained by dissecting Lipschitz Cauchy data. This discrepancy appears as a consequence of inadequate parameters values in the constitutive relations. For Cauchy noisy data, the difference between these solutions would be small if the parameters used in the solution are correct. Differentiable and non-differentiable optimization algorithms can then be used in the reconstruction of these parameters simultaneously.