INSTITUTUL DE MATEMATICA “SIMION STOILOW” AL ACADEMIEI ROMANE

Conferința lunară

Stable Gradient-Based Iterative Algorithms for Inverse BVPs in Steady-State Anisotropic Heat Conduction

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la sediul **IMAR**, amfiteatrul “Miron Nicolescu”, parter

Abstract: We investigate the numerical reconstruction of the missing thermal boundary conditions on an inaccessible part of the boundary in the case of steady-state heat conduction in anisotropic solids from the knowledge of over-prescribed noisy data on the remaining accessible boundary. This inverse problem is tackled by employing a variational formulation which transforms it into an equivalent control problem, with the mention that four such approaches are presented. As a direct consequence of this approach, a gradient-based iterative algorithm is obtained for each of these formulations. The numerical implementation is realized in the 2D case via the boundary element method (BEM) for both exact and perturbed data. For noisy Cauchy data the numerical solution is stabilised/regularised by stopping the iterative procedure according to Morozov's discrepancy principle and Nemirovskii’s rule.