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ABSTRACTS OF TALKS

Numerical approximation of a 2D parabolic time-dependent problem with delta function

Dejan R. Bojovic

Faculty of Science, University of Kragujevac
Radoja Domanovica 12, 34000 Kragujevac
Serbia
bojovicd@ptt.rs

Joint work with: B. Sredojevic, B. S. Jovanovic

One interesting class of parabolic problems models processes in heat-conduction media with concentrated capacity, in which the heat capacity coefficient contains a Dirac delta function. Such problems are nonstandard, and the classical tools of the theory of finite difference schemes are difficult to apply to their convergence analysis. In the present paper a finite-difference scheme, approximating two-dimensional initial-boundary value problem for the heat equation with concentrated capacity and time-dependent coefficients of the space derivatives, is derived. Abstract operator method is developed for analyzing this problem. Convergence in special discrete $\widetilde{W}_2^{1,1/2}$ anisotropic Sobolev norm is proved.

Keywords: Partial differential equations, Delta function, Sobolev norm, Convergence.