

**METHODS OF NUMERICAL AND NONLINEAR
ANALYSIS WITH APPLICATIONS**

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Numerical approximation of 2D parabolic interface problem with variable coefficients

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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 variable coefficients of the space derivatives, is derived. Abstract operator method is developed for analyzing this problem. Convergence in special discrete $\widetilde{W}_2^{2,1}$ anisotropic Sobolev norm is proved.