Jayakumar, Kokila
Modified quasi-boundary value method for the multidimensional nonhomogeneous backward time fractional diffusion equation. (English) Zbl 07387604

Summary: This study deals with the inverse problem of retrieving the initial status for a fractional diffusion system from the measured final and source data. Here, the mentioned system is taken as a nonhomogeneous time fractional diffusion problem in a general bounded domain $\Omega \subset \mathbb{R}^n$. A regularized sought solution is obtained by the regularization scheme, namely, modified quasi-boundary value method. Further, the convergence estimates between the exact and regularized solution are derived based on the choice of strategies of the regularization parameter. Eventually, numerical examples are illustrated to show the efficiency of the proposed method.

MSC:
35R30 Inverse problems for PDEs
35K20 Initial-boundary value problems for second-order parabolic equations
26A33 Fractional derivatives and integrals
33E12 Mittag-Leffler functions and generalizations

Keywords:
Mittag-Leffler function; regularization; retrieving the initial status; measured final and source data

Full Text: DOI