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Identification of a time-dependent coefficient in a partial differential equation subject to an extra measurement. (English) [Zbl 1069.65104](#)

Numer. Methods Partial Differ. Equations 21, No. 3, 611-622 (2005).

Summary: The problem of recovering a time-dependent coefficient in a parabolic partial differential equation has attracted considerable recent attention. Several finite difference schemes are presented for identifying the function $u(x, t)$ and the unknown coefficient $a(t)$ in a one-dimensional partial differential equation. These schemes are developed to determine the unknown properties in a region by measuring only data on the boundary. Our goal has been focused on coefficients that presents physical quantities, for example, the conductivity of a medium. For the convenience of discussion, we will present the results of numerical experiments on several test problems.

MSC:

- [65M32](#) Numerical methods for inverse problems for initial value and initial-boundary value problems involving PDEs
- [65M06](#) Finite difference methods for initial value and initial-boundary value problems involving PDEs
- [35K05](#) Heat equation
- [35R30](#) Inverse problems for PDEs

Cited in **52** Documents

Keywords:

finite difference methods; conductivity of a medium; determination of a time-dependent coefficient; over-specified data; inverse problem; heat equation; numerical experiments

Full Text: [DOI](#)

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