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Reconstruction of external actions under incomplete information in a linear stochastic equation. (English. Russian original) [Zbl 1365.93531](#)

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Summary: The problem of reconstructing unknown external actions in a linear stochastic differential equation is investigated on the basis of the approach of the theory of dynamic inversion. We consider the statement when the simultaneous reconstruction of disturbances in the deterministic and stochastic terms of the equation is performed with the use of discrete information on a number of realizations of a part of coordinates of the stochastic process. The problem is reduced to an inverse problem for systems of ordinary differential equations describing the mathematical expectation and covariance matrix of the original process. A finite-step software-oriented solution algorithm based on the method of auxiliary controlled models is proposed. We derive an estimate for its convergence rate with respect to the number of measured realizations.

MSC:

[93E12](#) Identification in stochastic control theory

[60H10](#) Stochastic ordinary differential equations (aspects of stochastic analysis)

[93C05](#) Linear systems in control theory

[93B17](#) Transformations

[93B40](#) Computational methods in systems theory (MSC2010)

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Keywords:

dynamic reconstruction; stochastic differential equation; controlled model; dynamic inversion; inverse problem for systems of ordinary differential equations; mathematical expectation; covariance matrix

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