

Rozenberg, V. L.

Reconstruction problem with incomplete information for a quasilinear stochastic differential equation. (English. Russian original) [Zbl 1505.93289](#)

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Summary: The problem of reconstructing unknown external disturbances in a quasilinear stochastic differential equation is considered within the framework of dynamic inversion theory. The disturbances in the deterministic and stochastic terms of the equation are reconstructed using discrete information on realizations of some coordinates of the stochastic process. The problem is reduced to an inverse one for a system of nonlinear ordinary differential equations satisfied by the expectation and the covariance matrix of the original process. A finite-step software implementable solution algorithm based on the method of auxiliary controlled models is proposed, and its accuracy with respect to the number of measurable realizations is estimated. A model example is given.

MSC:

[93E20](#) Optimal stochastic control

[93C15](#) Control/observation systems governed by ordinary differential equations

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

Keywords:

quasilinear stochastic differential equation; dynamic reconstruction; incomplete input data; controlled model

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