



Robust Observers for a Class of Uncertain Nonlinear Stochastic Systems with State Delays*

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Abstract: This paper investigates the problem of robust observer design for a class of nonlinear stochastic systems with state delays and time-varying norm-bounded parameter uncertainties. The nonlinearities are assumed to satisfy the global Lipschitz conditions and appear in both the state and measured output equations. The purpose is to design a nonlinear observer ensuring mean square asymptotic stability for the error system, irrespective of the uncertainties and the time delays. A sufficient condition for the solvability of this problem is derived in terms of a linear matrix inequality and the explicit formula of a desired robust observer is also given. An example is given to illustrate the proposed approach.

Keywords: *Linear matrix inequality; nonlinear systems; robust observers; stochastic systems; time-delay systems; uncertain systems.*

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