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**On input-to-state stability of nonlinear stochastic hybrid systems.** (English) Zbl 1263.93202  
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**Summary:** This paper is concerned with the input-to-state stability concept of nonlinear stochastic hybrid systems with bounded disturbance input. The main objective of the paper is to develop Lyapunov-like sufficient conditions guaranteeing the stability property of the  $p$ th moment. To control the switching among the system modes, we adopt two switching rules, a newly developed initial-state-dependent dwell-time and Markovian switching.

It has been shown that the stability property of individual modes is neither necessary nor sufficient to ensure the stability of the switched system. Implications of these results are also stated, and some examples are worked out to justify the effectiveness of the proposed theoretical results.

**MSC:**

- 93D25 Input-output approaches in control theory
- 93E15 Stochastic stability in control theory
- 93C30 Control/observation systems governed by functional relations other than differential equations (such as hybrid and switching systems)
- 93C10 Nonlinear systems in control theory
- 60J75 Jump processes (MSC2010)

**Keywords:**

nonlinear system; switched system; input-to-state stability; Wiener process; initial-state-dependent dwell-time; Markovian switching; nonlinear stochastic hybrid systems; Lyapunov-like sufficient conditions; bounded disturbance input

**Full Text:** [Link](#)