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转移概率部分未知的随机Markov 饱和切换系统的非脆弱镇定

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Non-fragile stabilization for stochastic system with Markov switching under partly unknown transition rates and actuator saturation

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摘要

研究一类转移概率部分未知的随机Markov饱和切换系统的非脆弱镇定问题. 基于参数依赖型Lyapunov函数, 设计非脆弱状态反馈控制器以保证闭环饱和系统的随机稳定性, 在此基础之上, 通过求解线性矩阵不等式, 得到均方意义下的最大不变吸引域. 数值仿真验证了所提出方法的有效性.

关键词 : Markov, 转移概率部分未知, 饱和系统, 随机稳定性, 线性矩阵不等式

Abstract :

The problem of non-fragile stabilization for the stochastic system with Markovian switching under partly unknown transition rates and actuator saturation is considered . By employing the parameter-dependent Lyapunov methodology, the non-fragile state feedback controller is proposed to guarantee the stochastic stability of the resulting closed-loop saturated system. Based on the obtained results, sufficient conditions with LMI constraints are established to acquire the largest contraction invariant set in the mean square sense. Finally, an example is given to illustrate the effectiveness of the proposed method.

Key words : Markov partly unknown transition rates actuator saturation stochastic stability LMI

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