

论文与报告

线性切换系统的积分不变性原理

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摘要

将积分不变性原理进行推广, 用来讨论线性切换系统的稳定性. 作为LaSalle不变性原理的推广, 文中推广的积分不变性原理无需构造Lyapunov函数, 而是利用系统输出的可积性, 讨论线性切换系统输出为零的状态集合的稳定性. 另外, 讨论了切换系统状态集合稳定性与切换信号之间的关系. 利用线性切换系统的可观测性, 讨论了系统平衡点的渐近稳定性. 数值例子说明了文中方法的有效性.

关键词 [线性切换系统](#) [积分不变性原理](#) [集合稳定](#) [可观测](#)

分类号

An Integral Invariance Principle for Switched Linear Systems

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Abstract

An integral invariance principle is extended to discuss the stability of switched linear systems. The integral invariance principle proposed in this paper can be viewed as an extension of the LaSalle invariance principle. The convergence of the solutions to a set in which the system outputs are zero is obtained by using the integrability of the system outputs instead of the Lyapunov function. Moreover, the relationship between the stability of the state set and the switching signals is discussed. Asymptotic stability of the equilibrium can be obtained under the condition that the switched linear systems are observable. Numerical examples are employed to verify the proposed method.

Key words [Switched linear systems](#) [integral invariance principle](#) [set stability](#) [observability](#)

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