

短文

二阶线性切换系统指数镇定的充要条件

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摘要

考虑二阶切换系统的镇定问题. 基于极坐标表示, 揭示了由锥形区域所界定的切换控制与子系统几何性质之间的自然联系. 由此, 建立了可镇定的充分必要条件; 并从代数与几何两方面刻画了镇定切换控制的特征. 进而给出了状态轨线指数收敛率的估计, 并阐释了由切换产生极限环与滑模运动的机理. 数值例子详细说明了结论的有效性.

关键词 [二阶切换系统](#) [指数镇定](#) [极限环](#) [滑模运动](#)

分类号

Necessary and Sufficient Conditions for Exponential Stabilization of Second-order Linear Switched Systems

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Abstract

The stabilizability of second-order switched systems is investigated. Based on polar-coordinates interpretation, the inherent connection between conic switching rules and qualitative features of the subsystems is presented. Therefore, necessary and sufficient stabilizability conditions are established, and stabilizing switching rules are characterized from both the algebraic and geometric viewpoints. Moreover, a convergent rate for the forced trajectory can be estimated, and the limit cycles and sliding motions generated by switching are explained constructively. Finally, numerical examples are worked out in detail to illustrate the results.

Key words [Second-order switched systems](#) [exponential stabilization](#) [limit cycles](#) [sliding motions](#)

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