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有限对象集合的同时镇定与分组设计

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SIMULTANEOUS STABILIZATION AND DESIGN IN GROUPS OF A FINITE SET OF PLANTS

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摘要 研究了有限对象集合同时镇定的基本理论问题。证明了 4 个对象可同时镇定的充要条件是存在 4 个稳定的多项式同时满足 2 个多项式方程。如果找到的多项式仅能满足其中一个方程，那么一定存在 2 个具有公分母或公分子的控制器使得它们分别同时镇定其中的 2 个对象。讨论了问题的可解性条件，进而给出了 3 个对象的分组与同时设计算法。

关键词： 同时镇定 鲁棒控制 系统设计

Abstract： This paper studies theoretically some basic aspects of simultaneous stabilization of a finite set of plants. It is proved that four given plants are simultaneously stabilizable if and only if there exist four stable polynomials simultaneously satisfying two polynomial equations. If the obtained four polynomials satisfy only one of the polynomial equations, then there must exist two controllers having a common denominator or numerator such that each controller can simultaneously stabilize two of the four given plants. Further, the solvability of the polynomial equations is discussed and a design procedure of simultaneous stabilization of three plants is provided.

Keywords： simultaneous stabilization robust control system design

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