

控制理论与实践

基于逆系统方法与内模原理的航天器姿态控制

胡立坤^{1,2},王庆超²

1. 广西大学电气工程学院, 广西 南宁 530004; 2. 哈尔滨工业大学航天学院, 黑龙江 哈尔滨 150001

摘要:

提出将逆系统方法与内模原理相结合的复合控制器应用于航天器姿态控制。采用基于状态反馈的逆系统方法实现航天器姿态模型的解耦, 为了弥补解耦的非理想性, 采用内模原理设计闭环控制器, 并在改变航天器惯量与加入干扰和噪声的情况下, 分析了复合控制的鲁棒性, 仿真试验验证了方法的有效性。

关键词: 逆系统方法 姿态控制 内模控制

Spacecraft attitude control based on inverse system and internal model

HU Li kun,WANG Qing chao

1. Electrical Engineering Coll., Guangxi Univ., Nanning 530004, China; 2. School of Astronautics, Harbin Inst. of Technology, Harbin 150001, China

Abstract:

A spacecraft attitude controller, which combines the inverse system method with the internal model principle, is presented. The spacecraft attitude model is decoupled into three SISO systems via the inverse system method based on state feedback, and the closed loop controller based on the internal model principle remedies nonideal decoupling. Robustness of the combined controller are discussed, and simulation results demonstrate the effectiveness under changing inertia and adding disturbances and noises.

Keywords: inverse system method attitude control internal model control

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