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基于平方和优化的飞行器大角度姿态机动保性能控

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Title: Guaranteed Cost Controller Design of Spacecraft Wide Angle Attitude Maneuver Based on Sum-of-squares Optimization

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关键词: [优化控制](#); [大角度姿态机动](#); [平方和优化](#)

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摘要: 研究飞行器大角度姿态机动状态反馈保性能控制器设计问题。采用修正的Rodrigues参数建立了飞行器姿态控制运动模型,将非线性的飞行器姿态系统模型转化为线性参数可变模型(LPV模型)。将平方和优化技术和Lyapunov理论相结合,给出了飞行器大角度姿态机动保性能控制器设计方法。仿真结果表明了所提方法的有效性。

Abstract: The problem of state feedback guaranteed controller design for large angle attitude maneuver was investigated. By using modified Rodrigues parameters, the attitude dynamics of the spacecraft was represented in terms of linear parameter varying(LPV)systems. The state feedback guaranteed cost controller design approach was proposed by combining Lyapunov theory and sum of squares (SOS)optimization. Simulation results demonstrate the effectiveness of the proposed design approach.

参考文献/REFERENCES

- [1] Narendra Gollu. Switched control of satellites for global stabilization and local performance: A sum of squares approach [C]// 2008 American Control Conference, Washington, USA, June 11-13, 2008: 2987-2992.
- [2] Narendra Gollu,Luis Rodrigues. Control of large angle attitude maneuvers for rigid bodies using sum of squares [C]// Proceedings of the 2007 American Control Conference,New York City, 2007: 3156-3161.
- [3] Hong-Jun Ma,Guang-Hong Yang. Fault tolerant H_∞ control for a class of nonlinear discrete-time systems:

Using sum of squares optimization[C]//2008 American Control Conference WeC11.1 Westin Seattle Hotel, Seattle, Washington, USA June 11-13. 2008:1588-1593.

[4] Hong-Jun Ma, Guang-Hong Yang. Fault-tolerant control synthesis for a class of nonlinear systems:Sum of squares optimization approach [J].International Journal of Robust and Nonlinear Control, 2009,19(5):591-610.

[5] 王勇军,秦永元,舒东亮. Rodrigues参数与四元数间的关系分析 [J].火力与指挥控制,2008,33(3):71-73.

[6] 陈记争,袁建平,方群. 双Rodrigues参数方法在姿态确定中的应用 [J].宇航学报,2008(2):534-540.

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