

عنوان مقاله:

Model Predictive Fault Tolerant Control of Two-Tethered Satellite System

محل انتشار:

مجله علوم و مهندسی هوافضا، دوره 14، شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 14

نویسندگان:

Mahya Ramezani - Faculty of New Sciences and Technologies, University of Tehran

Nima Assadian - Department of Aerospace Engineering, Sharif University of Technology, Tehran

خلاصه مقاله:

The purpose of this paper is to propose a method for the dual space tether system to continue its mission in the event of a failure by using fault-tolerant control. To accomplish this, a new and accurate model of a space tether with two tethers has been introduced, which can demonstrate the effects of the tensile force more precisely in the model. One of the features of this model is the ability to modify the junction of the tethers to the subsatellite, which can be included as a control parameter in the problem. As a result, the fuel required to control the mission can be decreased. To mitigate the effects of tether failure, a fault-tolerant control strategy based on model predictive control (MPC) has been developed for the nonlinear space tether system. This control method has the advantage of being both optimal and capable of controlling the system in the event of a failure. The simulation results demonstrate that the proposed control method is capable of controlling the dual spatial tether system despite thruster and tether failure.

کلمات کلیدی:

Space tether system, Fault-tolerant control, Nonlinear Model Predictive Control, attitude and position control

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1706346>

