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柔性空间飞行器的变结构控制

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A VARIABLE STRUCTURE CONTROL APPROACH TO FLEXIBLE SPACECRAFTS

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摘要 本文研究了大型柔性结构空间飞行器的控制问题。采用设定模态法,将系统化为常微分方程组所描述的系统。此系统是非线性的,被控运动是绕中心毂体的转动机动运动,并详细的讨论了变结构控制规律的应用。

关键词：

Abstract： In this paper the approach of variable structure control strategy （VSCS） is applied to the control problems of large flexible spacecrafts taking the nonlinear forces into consideration. As the "assumed modes method" is employed, the measurement technique for obtaining the mode coordinates is studied. After the analysis of a suggested reaching law, the overall nonlinear feedback control law is established. This reaching law guarantees on one hand an exponential reaching velocity and a finite reaching time by diminishing the chattering phenomenon on the other hand. It is assumed that the torque may be more adequate than the force used as control actions. Some further efforts are needed as indicated in the conclusion.

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