航空学报
ACTA AERONAUTICA ET ASTRONAUTICA SINICA
ISSN 1000-6893
CN 11-1929/V

航空学报 » 1996, Vol. 17 » Issue (6) :118-122 DOI:

自适应桁架结构振动控制中主动构件的最优配置

李俊宝, 刘华, 张令弥

南京航空航天大学振动工程研究所, 南京, 210016

OPTIMAL PLACEMENT OF ACTIVE MEMBERS IN ACTIVE VIBRATION CONTROL OF ADAPTIVE TRUSS STRUCTURES

Li Junbao, Liu Hua, Zhang Lingmi

Institute of Vibration Engineering Research, Nanjing University of Aeronautics and Astronautics, Nanjing, 210016

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摘要 主动构件的最优配置对于自适应桁架结构的设计和振动控制十分重要。为了确定主动构件在自适应桁架结构中的配置，通过引入闭环模态耗散能因子概念，来评价主动构件在结构振动阻尼控制中引入的结构模态主动阻尼的相对大小，由此建立主动构件配置多目标优化问题，并通过一平面自适应桁架结构优化数值计算，说明了该优化配置方法的正确性和有效性

关键词： 优化配置 振动控制 主动构件 自适应桁架结构

Abstract： In the design and active vibration control of adaptive truss structures, the determination of active members locations is a very important issue. In order to find the optimal placements of active members in adaptive truss structures, a concept of closed modal dissipation energy ratio is developed in this paper, which can be used to evaluate the distribution of the active damping introduced in the active members vibration control to structural modal damping. On the basis, a multi objective optimization problem is built for the active members placements. The optimal computation of a planar adaptive truss structure demonstrates that the method presented here is feasible and available.

Keywords： optimal placement active vibration control active member adaptive truss structure

Received 1995-08-28; published 1996-12-25

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引用本文:

李俊宝;刘华;张令弥. 自适应桁架结构振动控制中主动构件的最优配置[J]. 航空学报, 1996, 17(6): 118-122.

Li Junbao;Liu Hua;Zhang Lingmi. OPTIMAL PLACEMENT OF ACTIVE MEMBERS IN ACTIVE VIBRATION CONTROL OF ADAPTIVE TRUSS STRUCTURES[J]. Acta Aeronautica et Astronautica Sinica, 1996, 17(6): 118-122.