



航空学报 » 1998, Vol. 19 » Issue (4) :17-21 DOI:

论文

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电子阻尼的增进——局部激励应变的补偿

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PROMOTION OF ELECTRONIC DAMPING BY MEANS OF LOCAL STRAIN COMPENSATION

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摘要

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摘要 分析了以压电陶瓷片为作动和测量元件, 构成速度负反馈的闭环控制的“电子阻尼技术”之所以不能大幅度增加结构阻尼的原因。提出了“局部激励应变补偿”和把通常的微分负反馈改为低截止频率的惯性环节正反馈的控制新方案。压电悬臂梁的实验表明, 它们能使结构模态阻尼比大幅提高。

关键词:

Abstract: It was noticed that the increased damping of structures by means of electronic damping techniques, a kind of velocity feedback closed loop with piezoceramic wafers as actuators and sensors, was rather limited. The causes are analyzed. A new control approach is presented with a "local strain compensation" and a low cutoff frequency inertial link feedback in place of the differential one. The subsequent experiments on a piezoelectric beam show that the structural modal damping ratio can be promoted significantly.

Keywords:

Received 1998-04-01;

引用本文:

姚军; 李岳锋; 朱德懋; 姚起杭; 刘娟. 电子阻尼的增进——局部激励应变的补偿[J]. 航空学报, 1998, 19(4): 17-21.

Yao Jun; Li Yuefeng; Zhu Demao; Yao Qihang; Liu Juan . PROMOTION OF ELECTRONIC DAMPING BY MEANS OF LOCAL STRAIN COMPENSATION[J]. Acta Aeronautica et Astronautica Sinica, 1998, 19(4): 17-21.

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