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电（磁）涡流技术在振动疲劳试验中的应用

徐志怀

南京航空学院

THE APPLICATION OF ELECTRO-MAGNETIC EDDY CURRENT TECHNIQUE FOR VIBRATION FATIGUE TESTING

Xu Zhihuai

Nanjing Aeronautical Institute

摘要

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摘要 根据电（磁）涡流技术研制出一种新型振动疲劳试验设备,其工作频带宽、高频特性好。系统中引进串联电容谐振方案,显著地提高了能量利用,大大降低了功率消耗。在疲劳试验技术方面开创了一种新的激振方法。本文阐明了电（磁）,涡流激振的工作原理,性能特点,叙述了磁路分析与结构设计、电容谐振方案、振幅自动挂制与遥控监测等。最后,介绍了用该设备对发动机叶片进行振动疲劳试验,其结果是令人满意的。

关键词:

Abstract: A new type of equipments for vibration fatigue testing, which is based on electro-magnetic eddy current technique, is developed. It has advantages of wide frequency band, and good performance of high frequency. In this system a capacitor is used to generate series resonance, therefore the power consumption is greatly decreased. A new method of vibration exciting is developed in the technical area of structural fatigue tests. The principle, performance and characteristics of the electro-magnetic eddy current exciting are illustrated in this paper. Analysis of the magnetic circuit, design of the structure, scheme of the series resonance, automatic control of the amplitude and remote monitoring are described. Finally, the fatigue testing of engine blades is introduced by this system, and it is shown that the results of the experiments are satisfactory.

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