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### 飞机结构疲劳试验载荷的优化设计

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### OPTIMUM DESIGN OF FATIGUE TESTING LOADS FOR AIRPLANE STRUCTURES

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摘要

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**摘要** 提出用对载荷误差求极值的方法实现最小误差控制的试验载荷计算,并通过精度加权系数综合控制误差的合理分配,完成试验载荷的优化设计。该方法已经应用于某型飞机疲劳试验的试验载荷计算,为该机全尺寸疲劳试验的成功奠定了基础。

**关键词:** 疲劳试验载荷 载荷误差 载荷精度加权系数 载荷优化方程组

**Abstract:** In full scale fatigue testing for airplane structures, the loads, which are used to simulate the load spectrum of various flying status in airplane service, are imposed on finite loading spots. Whether the loading is accurate or not, the testing loads calculation is needed to guarantee its precision. In this paper, the method of finding extremum for load error is proposed. The method realizes calculation of minimum error control. The load optimum design is completed through rational error distribution by using error synthetical control of weighted precision coefficients. This method is applied to fatigue testing loads calculation for a type of airplane. It is the basis of the successful full scale fatigue testing of the airplane.

**Keywords:** load of fatigue testing load error weighted coefficients of loading precision optimal load simultaneous equations

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