航空学报 » 1992, Vol. 13 » Issue (3) :197-201 DOI:

飞机结构声疲劳分析与抗声疲劳设计

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SONIC FATIGUE ANALYSIS AND ANTI-SONIC FATIGUE DESIGN OF AIRCRAFT STRUCTURE

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摘要 本文应用一种快速分析方法计算了多种飞机典型结构件。用不同结构形状的结构响应频率确定声谱和声疲劳累积损伤率。用一种DSR(细节声额定值)系统确定声疲劳品质。文章最后叙述了飞机结构的抗声疲劳设计。

关键词： 声疲劳 累积损伤率 细节声额定值 结构响应频率 声疲劳品质

Abstract： Sonic fatigue is a phenomenon whereby noise forces structure to vibrate and develop cracks. Many kinds of the typical structural specimens of aircraft are calculated in this paper by use of a quick analysis method. The main characteristics of the method are: Various noise spectrum shapes can be accommodated. Structural response frequency expressions for different structural configurations define the response in the acoustic spectrum and sonic fatigue damage accumulation rate. Unit stress response expressions for different structural configurations define panel stress response for unit loading. A DSR (Detail Sonic Rating) system is used to define structural sonic fatigue quality. The anti-acoustic fatigue design of aircraft structure discussed in the paper.

Keywords： sonic fatigue damage accumulation rate detail sonic rating structural re- sponse frequency sonic fatigue quality

Received 1989-12-30; published 1992-03-25

引用本文:

张秀义. 飞机结构声疲劳分析与抗声疲劳设计[J]. 航空学报, 1992, 13(3): 197-201.

Zhang Xiu-yi. SONIC FATIGUE ANALYSIS AND ANTI-SONIC FATIGUE DESIGN OF AIRCRAFT STRUCTURE[J]. Acta Aeronautica et Astronautica Sinica, 1992, 13(3): 197-201.