



航空学报 » 2009, Vol. 30 » Issue (2) :271-275 DOI:

简报

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | Next Articles >>

连接件疲劳寿命分析的等效SSF法

张成成¹, 姚卫星¹, 叶彬²

1.南京航空航天大学 飞行器先进设计技术国防重点学科实验室 2.六五零设计研究所 洪都航空工业集团

Equivalent Stress Severity Factor Approach for Fatigue of Multi-fastener Plate

Zhang Chengcheng¹, Yao Weixing¹, Ye Bin²

1.Key Laboratory of Fundamental Science for National Defense Advanced Design Technology of Flight Vehicles, Nanjing University of Aeronautics and Astronautics 2.Institute 650, Hongdu Aviation Industry Group

摘要

参考文献

相关文章

Download: PDF (1238KB) HTML OKB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 传统的应力严重系数(SSF)法在复杂几何和载荷边界下几乎无法获得SSF值,而采用三维有限元法只能获得孔边最大应力,但不能计及钉孔质量和填充系数影响,且计算复杂不便于工程应用。本文将由有限元获得的连接件中的紧固件及周边平衡载荷系等效为两个单轴载荷,通过两个单轴载荷作用下应力场的叠加,并引入复杂几何和载荷边界对SSF的影响,而获得等效SSF值,并用有限元法对本文建立的最大应力近似公式进行了验证。算例结果表明,本文的计算方法简单有效。

关键词: 连接件 应力场 应力严重系数 应力集中 疲劳

Abstract: The traditional stress severity factor (SSF) approach is almost unable to obtain the SSF value under complex geometry and loading boundaries. The maximum stress at the edge of a hole can be obtained easily by 3D FEM, but the process is time consuming if the quality and filling status of the pin-loaded holes are included in the FE model; moreover, the maximum stress obtained by FEM cannot be readily used to predict the fatigue life of a plate. Therefore an equivalent SSF approach is proposed in this article to predict the fatigue life of a plate with loading born holes under complex geometry and loading boundaries. The equivalent SSF value is deduced by the superposition of two uniaxial stress fields in the region of the hole, and the effects of complex geometry and loading boundaries are considered at the same time. The fatigue life of a multi fastener plate of an aircraft tank is analyzed and verification test is made as an example. The results show that the fatigue life estimation is in good agreement with the experimental results.

Keywords: multi-fastener joint stress field stress severity factor stress concentration fatigue

Received 2007-11-08; published 2009-02-15

Corresponding Authors: 姚卫星

引用本文:

张成成;姚卫星;叶彬. 连接件疲劳寿命分析的等效SSF法[J]. 航空学报, 2009, 30(2): 271-275.

Zhang Chengcheng; Yao Weixing; Ye Bin. Equivalent Stress Severity Factor Approach for Fatigue of Multi-fastener Plate[J]. Acta Aeronautica et Astronautica Sinica, 2009, 30(2): 271-275.

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

作者相关文章

- ▶ 张成成
- ▶ 姚卫星
- ▶ 叶彬