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对称与非对称斜削耳片危险部位及应力强度因子的有限元分析

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FINITE ELEMENT ANALYSES (FEA) OF CRITICAL SITES AND SIF OF SYMMETRIC AND NON SYMMETRIC TAPERED LUGS

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摘要 采用多种有限元素进行有机组合建立有限元计算模型，模拟飞机结构中典型耳片接头的构型特征及载荷特征，进行考虑销钉与耳片之间配合间隙影响的非线性接触分析。分别通过无裂纹及含裂纹结构的计算研究，得到对称与非对称斜削耳片在不同方位载荷作用下的危险部位及相应含裂结构的裂纹尖端应力强度因子，给出覆盖面广的计算曲线，并分析研究其抗断裂特性。通过与现有文献比较表明，其数值结果精确，方法可靠。

关键词：

Abstract： Non linear contact analyses of lugs and pins under different fitting conditions have been done by FEM to simulate the typical working conditions of different kinds of lugs in aircraft structures under loads in various directions.In the FEA models, several kinds of finite elements have been used. First, critical sites are obtained by FEA of the lugs without cracks under various loads. Second, the SIF are computed by the FEA of lugs with cracks initiated at the critical sites under the same loads. Then several sets of curves of SIF have been given for lugs of different shapes under different loads. Based on those SIF, some fracture mechanics characters of the lugs have been found. The accuracy of the results and the reliability of the numerical method and the computer codes used in this paper have been demonstrated by comparisons between SIF of some lug obtained here and those in literature. Therefore, the numerical results and some conclusions given in this paper can be used as a basis for the damage tolerance design of lug connecting.

Keywords：

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