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航空结构损伤容限设计中的三维问题

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THREE DIMENSIONAL PROBLEM IN DAMAGE TOLERANCE DESIGN OF AIRCRAFT STRUCTURES

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摘要	参考文献	相关文章

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摘要 在对三维断裂问题研究的基础上，对航空结构损伤容限评定中的三维问题进行了综合评述。详细分析了现行损伤容限分析的断裂力学基础、剩余强度评定、材料抗裂性能确定、常幅及谱载荷下寿命预测等重要环节中三维应力状态的作用，提出了解决问题的初步设想，给出了一些最新结果。并对介质、温度环境和载荷共同作用下材料失效中的三维问题等做了简述。最后提出了实现高可靠性损伤容限设计必须解决的三维问题。

关键词： 航空结构   损伤容限   三维分析

Abstract： A survery of the development of fracture mechanics is given on the basis of damage tolerant design of structures.The effects of three dimensional stress state on residual strength,fatigue crack propagation life under cnstant-as well as variable-amplitude loading of aircraft structures and cracking resistance of aircraft materials are analyzed in detail.Some ideas on solving the roblems are proposed and some new results worked out by the author are presented.A brief discussion is made on three dimensional effects upon fatigue and fracture resistance of materials at elevated temperatures and in corrosion environments,durability of airframe,etc.Finally,a list of three dimensional problems is proposed,which must be solved to improve the techniques of damage tolerant design of aircraft structures.

Keywords： aircraft structure   damage t olerances design   three dimensional analysis

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