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含多裂纹结构的概率损伤容限评定方法

费斌军, 童明波, 刘文廷

北京航空航天大学固体力学所, 北京, 100083

PROBABILITY DAMAGE TOLERANCE EVALUATION METHOD FOR MULTI -CRACKED STRUCTURE

Fei Binjun, Tong Mingbo, Liu Wenting

Beijing University of Aeronautics and Astronautics, Beijing, 100083

摘要

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摘要 将概率断裂力学理论与损伤容限 / 耐久性设计方法有机地结合起来, 考虑结构初始疲劳裂纹尺寸及其扩展过程的随机性, 建立了裂纹相互独立条件下的多裂纹结构的全寿命概率损伤容限评定模型, 并成功地运用于机翼主梁的可靠性评定, 给出指定疲劳寿命下的安全可靠度或指定安全可靠度下的安全疲劳寿命。

关键词: 概率 断裂力学 损伤容限

Abstract: Using the probability fracture mechanics, a new full-life probability damage tolerance evaluation model is established for multi-cracked structures, which considers the randomness of initial crack length and its propagation. Also established is a reliability model for multi-cracked structures. The above models are applied to one aircraft wing mainbeam to determine the safe reliability under given fatigue crack growth life or the safe fatigue crack growth life under given reliability.

Keywords: probability fracture mechanics damage tolerance

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