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### 战斗机单机寿命监控中起飞重量的影响

陈志伟, 朱青云, 薛军, 王智

北京航空工程研究中心

### Effect of Take-off Weight in Fighter Fatigue Life Monitoring

Chen Zhiwei, Zhu Qingyun, Xue Jun, Wang Zhi

Beijing Aeronautical Technology Research Center

摘要

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**摘要** 飞机不同的挂载重量使飞机每次起飞时实际载荷变化。主要通过飞行参数记录仪(FPR)记录的数据研究战斗机起飞外挂重量对飞机结构疲劳寿命的影响。对某型飞机的一次完整飞行,按不同起飞外挂情况计算其损伤比值,结果表明分散度达到设计基准的27%。通过调查飞机挂弹架次比例,发现情况变化随意性很强,基本无统计规律可循,因而按每架次实际起飞外挂重量计算疲劳损伤显得尤为必要。对3架飞机近3 000架次记录数据的分析表明,按实际起飞重量计算的结构疲劳损伤比按设计情况要轻约20%。这一研究结果为基于实际载荷监控进行单机延寿挖潜提供了技术支持。

**关键词:** 飞机寿命 寿命监控 外挂重量 载荷历程 疲劳 损伤

**Abstract:** The suspension weights of a fighter alters the actual service load for each take-off. How the variation of take-off suspension weights affects the structural fatigue life is investigated through surveying actual flight parameter recorder (FPR) data. For the fighter involved in the investigation, scatter in fatigue damage caused by take-off suspension weights during one flight can reach 27% of the design criteria. The investigation shows that actual take-off suspension weights chang considerably and irregularly, so it is important to calculate fatigue damage based on actual suspension weights for each flight. Analysis results of the complete recorded FPR histories for three aircrafts show that the actual fatigue damages are about 20% lighter than the design assumption, which provide technical support for extending individual aircraft service life based on load/life monitoring.

**Keywords:** aircraft life life monitoring suspension weight load history fatigue damage

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Corresponding Authors: 陈志伟

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