



北京航空航天大学学报 » 2011, Vol. 37 » Issue (9) :1169-1175 DOI:

论文

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适应未来大型飞机的水泥混凝土道面设计方法

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Airport concrete pavement design for large aircraft in future

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摘要

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摘要 现行水泥混凝土道面设计规范,采用“设计飞机”按疲劳等效原则将各型飞机的作用次数换算成“设计飞机”的作用次数,并假定飞机轮迹在通行宽度内均匀分布,实际上飞机轮迹在跑道横断面上服从正态分布.未来大型飞机的起落架更加复杂,各型飞机对道面的累积疲劳损伤峰值不在同一位置,采用“设计飞机”换算的方法日益暴露出不足.按轮迹服从正态分布采用覆盖通行率计算覆盖作用次数,用累积疲劳损伤替代了“设计飞机”在交通量换算中的作用,直接计算各型飞机对道面结构总的累积疲劳损伤,探讨了基于累积疲劳损伤的道面设计方法.实例分析表明:采用累计疲劳损伤作为设计指标的道面设计方法计算结果更精确,更适合未来大型飞机复杂起落架作用下的水泥混凝土道面设计.

关键词: 交通量 大型飞机 累积损伤曲线 覆盖通行率 水泥混凝土道面 机场

Abstract: The present concrete pavement design specification uses design aircraft to convert the traffic of other aircrafts into traffic of design aircraft according to the principle of equivalent damage, and it assumes that the wheel path in the lane of runway follows uniform distribution. Actually, wheel path follows the normal school, landing gear of new large aircraft becomes more complex, the peak value of cumulative damage of each aircraft maybe not at the same location, shortages of conversion method using design aircraft is increasing. Based on the wheel path in the lane of runway follows the normal school, pass-to-coverage ratio is used to calculate passes number. Design aircraft-s function is replaced by cumulative fatigue damage of pavement structure, which produced by all kinds of aircrafts is carried out directly. A new design method for concrete pavement based on cumulative fatigue damage is discussed and a design example is given. It is approved that the pavement design method using cumulative fatigue damage as design index is more suitable for concrete pavement design of large aircraft with complex landing gear.

Keywords: traffic large aircraft cumulative damage curve pass-to-coverage ratio concrete pavement airport

Received 2010-10-22;

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引用本文:

吴爱红, 蔡良才, 顾强康, 李光元.适应未来大型飞机的水泥混凝土道面设计方法[J] 北京航空航天大学学报, 2011,V37(9): 1169-1175

Wu Aihong, Cai Liangcai, Gu Qiangkang, Li Guangyuan.Airport concrete pavement design for large aircraft in future[J] JOURNAL OF BEIJING UNIVERSITY OF AERONAUTICS AND A, 2011,V37(9): 1169-1175

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