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含填充弹性地基双层道面板有限元分析及参数影响研究

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Analysis of Double Layer Plates on Inhomogenous Elastic Foundation by Finite Element Method and Investigation of Some Parameters Behavior

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摘要

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摘要 针对机场道面修复问题,建立了一种飞机荷载-盖层-道面-含填充地基的力学模型。其中飞机荷载采用主起落架多轮荷载,盖层与道面采用Mindlin厚板理论。在此基础上,建立了问题的有限元求解格式,分别对道面板在飞机单轮和多轮荷载情况下进行了有限元数值分析,有关数值结果与实验结果吻合较好。最后研究了盖层厚度、填充半径对位移、应力的影响规律。

关键词: 飞机荷载 双层道面 Mindlin厚板 含填充弹性地基 有限元分析

Abstract: To deal with the runway repair problem, this paper presents a complicated mechanical model, which is composed of two double layer rectangular plates resting on inhomogenous elastic foundation under airplane load. An corresponding numerical procedure of Finite Element Method(FEM) based on the Mindlin plate theory is constructed. Numerical results show a good agreement with the experimental results. The effects of some parameters, such as the plate thickness, radius of the filled foundation, on the maximum deflections and stress, are also investigated.

Keywords: airplane load two layer runway Mindlin plate inhomogenous foundation FEM analysis

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