双剪统一弹塑性有限差分方法研究

Study of twin shear unified elastoplastic finite difference method

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中文摘要：

　　基于拉格朗日有限差分方法,建立了双剪统一弹塑性有限差分计算格式,并利用VC++语言编写动态链接库文件将双剪统一弹塑性模型导入拉格朗日有限差分程序FLAC(Fast Lagrangian Analysis of Continua)中进行计算分析。双剪统一弹塑性有限差分方法可以模拟复杂应力状态下结构的渐进破坏,无需形成刚度矩阵,对于材料非线性问题无需进行迭代计算,因此在理论和工程应用中都有积极的意义。本文利用双剪统一弹塑性有限差分方法对拉压强度不等材料的厚壁圆筒受内压、中心带孔板条受拉压、条形基础下的地基极限分析及边坡问题进行了数值分析并与滑移线场等解析方法计算结果进行对比,结果均吻合较好。

英文摘要：

　　Based on the Lagrangian finite difference method, format of twin shear unified elastoplastic finite difference is established. Twin shear unified elastoplastic model loaded into software of FLAC (Fast Lagrangian Analysis of Continua) using a dynamic-link library file which developed by VC++. The progressive failure of structure under complex stress state can be simulated by twin shear unified elastoplastic finite difference method, moreover, no stiffness matrix and nonlinear iterative created in the calculation proceess. Thus, it has positive significance for theory and application of engineering. In this paper, the thick walled cylinder under inner pressure, tension and compression of perforated plate, limit analysis of strip footing and slope problem for SD (Strength Difference) material is analyzed. The results of numerical and slip line field method are compared, and the results of two methods are similar.

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