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块状结构岩体在一般水压分布模式下的不连续变形分析

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摘要 提出了三维不连续变形分析方法中地下水压力的模拟方法。并通过钻孔水位观测数据插值拟合地下水位面，建立了作用在任意形状块体单元表面上的一般水压分布模式，利用最小势能原理推导了水压力荷载对三维不连续变形分析方法总刚矩阵的贡献。地下水对滑坡稳定性影响的算例分析表明该方法是有效的。

关键词 岩石力学；三维不连续变形分析方法；一般水压分布模式；边坡稳定性

分类号

THREE-DIMENSIONAL DISCONTINUOUS DEFORMATION ANALYSIS ON SURFACES OF ROCK BLOCKS WITH GENERAL MODEL OF WATER PRESSURE DISTRIBUTION

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Abstract

The discontinuous deformation analysis(DDA) is a powerful numerical method for the analysis of discontinuous rock mass behaviours. And the three-dimensional discontinuous deformation analysis(3D DDA) is extended to allow the consideration of groundwater pressure. In geological modelling，various geo-information can be expressed as functions of spatial variables. On the basis of groundwater observation data，a three-dimensional piezometric surface using a relevant fitting function is constructed. And a general model of water pressure distribution on the surfaces of rock blocks is established. The water pressure submatrices are then derived by minimizing the total potential energy and are added to the global matrices. The extension to 3D DDA has been incorporated into a 3D DDA computer program，and numerical results from two test cases show the reasonability of the method.

Key words rock mechanics；three-dimensional

discontinuous deformation analysis(3D DDA)；general water pressure distribution model；slope stability

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