地下水影响下裂隙岩质边坡变形的Fuzzy测度分析

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摘要　　根据裂隙岩质边坡工程实际，采用Fuzzy数学理论中的Fuzzy测度理论，将工程开挖引起裂隙岩质边坡移动变形这一客观现象视为一模糊事件，依此建立了在地下水影响下岩体移动变形预测分析的Fuzzy测度模型。利用该模型可对边坡岩体移动变形参数进行反分析，并可对边坡开挖过程中引起的岩体移动变形进行定量计算，进而对地下水影响下岩质边坡总体稳定性和稳定程度进行预测。对已有的矿山边坡岩体移动变形及其稳定性进行了具体的分析预测，结果符合工程实际。

关键词　　边坡工程；岩质边坡；岩体移动变形；地下水；Fuzzy测度
分类号

FUZZY MEASURES ANALYSIS FOR DISPLACEMENTS AND DEFORMATIONS OF JOINTED ROCK SLOPE UNDER INFLUENCE OF GROUNDWATER

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Abstract

The predictions of displacements and deformations of rock slopes are important in rock and soil mechanics and engineering. Various approximate methods have been used for such calculations. The displacement or deformation of a rock mass can be regarded as a fuzzy event that takes place at a fuzzy probability. Therefore，the theory of fuzzy measures can be applied to describe the displacements and deformations of rock slopes. Based on the results of the statistical analysis of a large amount of measured data in slope engineering，the fundamental fuzzy model of displacements and deformations of rock slope is established by using the theory of fuzzy measures. The formulas of two-dimensional problems are developed and applied to the predictions of displacements and deformations of rock slopes due to surface excavation. The fuzzy measures models presented are adopted for back analysis using displacement parameters. The agreement of the theoretical results with the field measurements shows that the model is satisfactory and the formulae obtained are valid，and thus can be effectively applied to predict the displacements，the failure of rock slopes due to mining，and the failure of slopes under the influence of groundwater.

Key words　slope engineering；rock slope；rock mass displacements and deformations；groundwater；fuzzy measures

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