论文

基于Fisher判别分析法的隧洞围岩分类

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摘要：

针对隧道围岩分类问题，基于Fisher判别分析理论，选用岩石质量指标、完整性指数、饱和单轴抗压强度、纵波波速、弹性抗力系数和结构面摩擦因数等6个指标作为判别因子，以30组隧洞围岩数据作为学习样本进行训练，建立相应的Fisher判别模型。利用回代估计方法对建模数据逐一进行检验，正确率达93.3%。将建立的判别模型应用于工程实例，预测结果与实际情况吻合良好，与Bayes判别法、神经网络模型判别结果一致。研究结果表明，Fisher判别分析用于围岩分类简便可行，正确率高，是解决隧洞围岩分类的一种有效方法。

关键词：　隧洞围岩；分类；Fisher判别分析

Classification of rocks surrounding tunnel using Fisher discriminant analysis method

Abstract:

Fisher discriminant model was established to the classification of rocks surrounding tunnel based on the principle of Fisher discriminant analysis theory(FDA).Six factors which reflecting the engineering quality of rock masses were selected such as the rock quality designation，integrity coefficient，uniaxialcompressive strength under saturation，longitudinal wave velocity，elasticity resisting coefficient and friction coefficient of joint planes as the discriminant factors of the FDA model.Discriminant functions were obtained through training of thirty sets of in situ data，each of the thirty sets of samples was tested by using resubstitution method according，and the correct rate was equal to 93.3%.The prediction result of other seven actual cases by the proposed method well accords with the actual situation，is agrees with the reality and agrees with Bayes discriminant and neural network method discriminant result.The results show that the FDA model is a simple，feasible and high accurate prediction method，and it is one of the efficient methods for solving classification of rocks surrounding tunnel.

Keywords: rocks surrounding tunnel;classification;Fisher discriminant analysis

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