

论文

煤层底板突水危险性的Fisher判别分析模型

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摘要:

为准确评价底板突水危险性, 考虑到不同影响因素对于评价方法的作用与影响不同, 运用逐步判别法剔除了判别效果不显著的指标, 选取了含水层富水性、水压、隔水层厚度、断层导水性、构造发育程度5项主要影响因素作为判别指标。根据以往突水数据建立了底板突水危险性的Fisher判别分析模型, 并绘制了判别空间中样本数据散点图。该模型通过了显著性检验, 分类效果显著。对15组训练样本进行回代判别, 误判率为0, 通过距离判别法准确预测了测试样本的突水危险性, 表明该模型在煤层底板突水危险性评价上具有较高的可信度和良好的实用性。

关键词: 煤层; 底板; 突水; Fisher判别; 逐步判别; 距离判别

A model of Fisher's discriminant analysis for evaluating water inrush risk from coal seam floor

Abstract:

In order to accurately evaluate the water inrush risk from coal seam floor, considering the different effects of various factors, the factors without significant discriminant effect were eliminated by using stepwise discriminant analysis. Five main influencing factors including aquifer property, water head, water resisting layer thickness, fault permeability and fractures development level were selected as discriminant indexes. Therefore, a discriminant model was developed based on the past data of water inrush. In addition, all the samples were mapped on a scatter diagram. This model which passed the significance tests shows a good classification effect. The misjudgment ratio of 15 training samples is zero and the water inrush risk of test samples are predicted accurately as well. The study shows that the discriminant model developed for evaluating water inrush risk from coal seam floor is of high reliability and practical applicability.

Keywords: coal seam; floor; water inrush; Fisher's discriminant analysis; stepwise discriminant analysis; distance discriminant analysis

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