论文

基于模糊证据理论的煤层底板突水量预测

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摘要：

从信息融合的角度，将煤层底板突水量预测过程看成是一个多源信息融合处理与状态估计过程，提出基于贴近度的模糊证据理论，建立基于模糊证据理论的煤层底板突水状态估计与评价模型。利用15个有代表性的采煤工作面底板突水资料作为训练样本，基于广义三角模糊数生成各焦元基本概率赋值。用所建立的突水预测模型对4个待检验的突水样本进行分析，并与人工神经网络、最小二乘支持向量机、距离判别分析等方法进行比较，所得结果一致或更好，说明基于模糊证据理论的煤层底板突水量估计方法具有良好的实用性和有效性。

关键词： 底板突水；突水量；模糊证据理论；突水预测

Prediction of water inrush quantity from coal floor based on fuzzy evidence theory

Abstract:

The predicting process of water inrush quantity from coal floor，as viewed from the perspective of information fusion，is a process of multi source information fusion and state estimation.Based on the degree of closeness，fuzzy evidence theory was proposed，and the model of state estimation and assessment for water inrush from coal floor was established by using fuzzy evidence theory.Fifteen representative engineering cases of water inrush from coal floor were taken as training samples.Based on the generalized triangular fuzzy number，the basic probability assignments were constructed.The prediction model was tested by four actual water inrush cases.The results are same or better than the results with artificial neural network，least square support vector machine，distance discriminant analysis or other methods，indicating that the proposed method based on degrees of closeness is practical and effective for water inrush quantity assessment.

Keywords: floor water inrush；water inrush quantity；fuzzy evidence theory；water inrush prediction

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