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基于PCA与支持向量回归的储层渗透率预测

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摘要 在测井技术与储层基本特征研究的基础上，对与渗透率相关的测井参数和岩心参数进行了分析，根据传统的储层渗透率预测方法，提出了一种基于主成分分析与支持向量回归的储层渗透率预测方法。应用主成分分析对测井参数和岩心参数进行数据降维，优选出与渗透率最相关的参数，将优选出的测井参数和岩心参数作为支持向量回归模型的输入参数进行渗透率预测。实验结果表明，利用主成分分析算法提取的特征参数与渗透率有较好的相关性，且支持向量回归具有较高的预测精度，显示出主成分分析和支持向量回归在储层渗透率预测中的优势与实际应用价值。

关键词 主成分分析 渗透率 支持向量回归 测井参数 岩心参数

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Prediction of reservoir permeability based on PCA and Support Vector Regression

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Abstract

By studying of the logging technology and basic characteristics of the reservoir together with the logging parameters and core parameters which related to reservoir permeability，a reservoir permeability predicting method is introduced based on the Principal Component Analysis（PCA） and Support Vector Regression（SVR） according to the traditional predicting methods of reservoir permeability.The PCA is used to reduce the dimensionality of the logging parameters and core parameters through which the optimizing relevant parameters of permeability are chosen.Then，the optimized relevant logging parameters and core parameters are imported to the SVR to predict reservoir permeability.The experimental results show that the extracted parameters through the PCA have a good relevance with the reservoir permeability，and the SVR has a high accuracy.It has been shown the strengths and practical application of the PCA and SVR used for the prediction of the reservoir permeability.

Key words Principal Component Analysis（PCA） permeability Support Vector Regression（SVR） logging parameters core parameters

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