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## 量子粒子群模糊神经网络碳酸盐岩流体识别方法研究

刘立峰<sup>1,2</sup>, 孙赞东<sup>1,2</sup>, 韩剑发<sup>3</sup>, 赵海涛<sup>3</sup>, 能源<sup>3\*</sup>

1. 中国石油大学(北京)地质地球物理综合研究中心, 北京 102249;
2. 中国石油大学(北京)油气资源与探测国家重点实验室, 北京 102249;
3. 中国石油天然气股份有限公司塔里木油田分公司, 新疆库尔勒 841000

A carbonate fluid identification method based on quantum particle swarm fuzzy neural network

LIU Li-Feng<sup>1,2</sup>, SUN Zan-Dong<sup>1,2</sup>, HAN Jian-Fa<sup>3</sup>, ZHAO Hai-Tao<sup>3</sup>, NENG Yuan<sup>3\*</sup>

1. Laboratory for Integration of Geology & Geophysics, China University of Petroleum, Beijing 102249, China.
2. State Key Laboratory of Petroleum Resource and Prospecting, China University of Petroleum, Beijing 102249, China.
3. PetroChina Tarim Oilfield Company, Korla, Xinjiang 841000, China

摘要

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摘要

根据不同流体性质在角度道集上所反映特征的差异, 构建了多属性角度叠加数据体组合流体识别因子. 并将量子粒子群与模糊神经网络相结合, 利用量子粒子群方法来优化模糊神经网络中的连接权值和隶属函数参数, 并进行一系列的改进措施, 显著提高了算法寻优能力. 将近远角度叠加数据体组合流体识别因子作为改进模糊神经网络的输入, 流体性质作为输出, 同时引入“相控流体思想, 利用碳酸盐岩储集相进行控制, 建立了碳酸盐岩流体识别模型. 通过塔中实际井区进行验证, 证明该方法能够提高流体识别度, 具有很好的实际应用价值.

关键词 量子粒子群, 模糊神经网络, 部分角度叠加数据体, 流体识别, 塔里木盆地

Abstract:

Given the fact that different fluids generate different responses on angle gathers, a comprehensive fluid factor is accordingly established based on multi-attributes that are extracted from partial-stacked datasets. Besides, a combination of quantum particle swarm technique and fuzzy neural network, in which the former is employed to optimize the connection weights and membership functions of the later. As a result, the global optimization of this hybrid algorithm is greatly enhanced. On utilizing the output of this improved fuzzy neural network where comprehensive fluid factors are taken as input, we conduct the research of carbonate reservoirs by introducing the idea of phased-control fluid identification. Ultimately, a fluid identification model for carbonate reservoir is finally established. Application in Tazhong area not only shows that this method can achieve higher accuracy of the fluid identification, but also fully proves this method's great practical potential.

Keywords Quantum particle swarm, Fuzzy neural network, Partial-stacked seismic datasets, Fluid identification, Tarim basin

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