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## 火山岩油气藏重磁电震综合预测方法及应用

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Comprehensive predication of hydrocarbon deposits in volcanic rock by gravity, magnetic, electrical and seismic data and its application

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摘要

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**摘要** 通过准噶尔盆地东地区数十口钻井资料的对比分析、归纳总结,提出了火山岩油气藏重磁电震综合预测方法.将正则化下延与延拓回返垂直二次导数串联形成了一个新的滤波器,该滤波器相当于首先通过正则化下延将位场曲面延拓至地下目的层段,降低火山岩埋深对磁力异常幅值的影响,然后利用延拓回返垂直二次导数对弱信号进行增强,不仅提高了位场异常的分辨率,而且由于对位场异常幅值信息进行了能量补偿,因而有利于利用增强后的位场异常的幅值划分火山岩岩性.利用该技术对准噶尔盆地东地区地震3D工区的重磁资料进行了处理,结合建场测深及3D地震资料进行了综合研究,并根据重磁电震等资料综合预测了火山岩油气藏目标.

**关键词:** 重力 磁力 建场测深 地震 综合地球物理 火山岩 天然气 准噶尔盆地

**Abstract:** From correlation studies of volcanic hydrocarbon exploration with tens of drilling data in Ludong area of Junggar Basin, China, a comprehensive predication scheme of hydrocarbon deposits in volcanic rock by gravity, magnetic, electrical and seismic data is proposed. By combining regularization downward continuation and return upward continuation vertical second derivation in series a new filtering algorithm is formulated. To reduce the depth effect of volcanic rocks on the magnetic anomalies the surface potential fields are downward continued to the targeted horizon, then the potential fields are enhanced by return upward continuation vertical second derivation. In result the field energy is compensated in contrast to the depth attenuation, which will help to identify the magnetic anomalies caused by volcanic rocks of different type with their anomaly amplitude. By applying the technique to gravity and magnetic data in Ludong area covered with 3D seismic data in Junggar Basin, China, the distribution of volcanic rocks is studied comprehensively by seismic data and TEM profiles and exploration targets of volcanic rock are predicted in Ludong area.

**Keywords:** Gravity Magnetic TEM Seismic Comprehensive geophysical study Volcanic rock Natural gas Junggar Basin

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