

开发地震反演可行性研究及应用--以大庆长垣北部油田为例

李占东¹, 赵伟², 李阳³, 彭政⁴, 张海翔^{5*}

1. 东北石油大学 石油工程学院,黑龙江 大庆 163318;
2. 中国石油 大庆油田有限责任公司 第六采油厂,黑龙江 大庆 163114;
3. 中国石油 大庆油田有限责任公司 第一采油厂,黑龙江 大庆 163257;
4. 中国石油 大庆油田有限责任公司 第二采油厂,黑龙江 大庆 163414;
5. 东北石油大学 地球科学学院,黑龙江 大庆 163318

Feasibility study and application of development seismic inversion-a case study from northern Changyuan oilfield of Daqing area

Li Zhandong¹, Zhao Wei², Li Yang³, Peng Zheng⁴, Zhang Haixiang^{5*}

1. College of Petroleum Engineering,Northeast Petroleum University,Daqing,Heilongjiang 163318,China;
2. The Sixth Production Plant,PetroChina Daqing Oilfield Company,Daqing,Heilongjiang 163114,China;
3. The First Production Plant,PetroChina Daqing Oilfield Company,Daqing,Heilongjiang 163257,China;
4. The Second Production Plant,PetroChina Daqing Oilfield Company,Daqing,Heilongjiang 163414,China;
5. College of Earth Sciences,Northeast Petroleum University,Daqing,Heilongjiang 163318,China

摘要

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摘要 为解决开发地震反演可行性和精细储层刻画的难题,提出了一种基于分频补偿的曲线重构方法。根据测井曲线不同频率尺度反映不同砂岩特征的特点,利用高频恢复、低频补偿方法重构“拟波阻抗”曲线。反演可行性分析实验表明,通过曲线重构反演、模拟退火算法引入以及密井网反演等关键技术,能够加强结果稳定性的优化,提高薄储层预测精度;同时,正演模拟和反演实践证明,在大套泥岩中含有薄砂层的地质条件下,开发地震对刻画2 m薄层砂岩是可行的。而对于小于2 m以下的薄砂层,仅当泥岩围岩在2 m以上的泥包砂型薄砂层能够进行分辨。井-震联合沉积相研究主要修正了河道侧积体识别、河道连通关系、河道规模变化、河道组合关系和河道期次划分等5个方面。规模较大的分流河道含油性好,形成较好的注采不完善型剩余油;小型分流河道局部含油性好,但河道窄小,以井网控制不住型剩余油为主。

关键词: [模拟退火](#) [井-震联合](#) [多期河道](#) [开发地震反演](#) [大庆长垣](#)

Abstract: In order to make development seismic inversion and fine reservoir description feasible,we proposed a curve reconstruction method based on frequency division compensation.As logs with different frequency can reflect features of different sandstones,we reconstructed "quasi-wave impedance" curves through high frequency restoration and low frequency compensation.Inversion feasibility analysis experiments showed that result stability could be optimized and reservoir prediction accuracy could be improved through introducing curve reconstruction inversion,simulated annealing algorithm and high well-dense inversion.Meanwhile,forward modeling and inversion proved that 2 meters thin sandstone layer interbedded in thick mudstone could be recognized through development seismic inversion.But for sandstone layers with thickness less than 2 meters,they can be recognized only when interbedded within mudstone layers greater than 2 meters thick.Well-tied seismic sedimentary facies study was also carried out to refine prediction of sandbody volume on sides of channel,channel sand connectivity,channel sand scale change,channel combination and timing of channels.Large distributary channel sandbodies are high in oil potential and remaining oil is commonly caused by imperfect injection-production well pattern.Small distributary channel sandbodies locally have high oil potential,and remaining oil is commonly caused by limited control area of well patterns.

Keywords: [simulate anneal](#) [well-tied seismic inversion](#) [multi-stage channel](#) [development seismic inversion](#) [Changyuan oilfield of Daqing area](#)

Received 2010-12-20;

Fund:

中国石油天然气股份有限公司"十一五"超前科研项目;教育部博士点基金项目(20050220001)。

About author: 李占东(1979-),男,博士,层序地层学与沉积储层地质学。

引用本文:

李占东, 赵伟, 李阳, 彭政, 张海翔. 开发地震反演可行性研究及应用--以大庆长垣北部油田为例[J] 石油与天然气地质, 2011,V32(5): 797-806

Li Zhandong, Zhao Wei, Li Yang, Peng Zheng, Zhang Haixiang.Feasibility study and application of development seismic inversion-a case study from northern Changyuan oilfield of Daqing area[J] Oil & Gas Geology, 2011,V32(5): 797-806

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