

引用本文(Citation):

张亚南, 戴永寿, 陈健, 魏玉琴, 丁进杰, 张漫漫. 用对称映射ARMA模型的零极点研究子波相位对反射系数序列反演的影响. 地球物理学报, 2013, 56(6): 2043-2054, doi: 10.6038/cjg20130625

ZHANG Ya-Nan, DAI Yong-Shou, CHEN Jian, WEI Yu-Qin, DING Jin-Jie, ZHANG Man-Man. The research on the influence of wavelet phase on the inversion results of reflection coefficient sequences by using the ARMA model of symmetrical mapping Pole-Zeros. Chinese Journal Geophysics, 2013, 56(6): 2043-2054, doi: 10.6038/cjg20130625

用对称映射ARMA模型的零极点研究子波相位对反射系数序列反演的影响

张亚南, 戴永寿, 陈健, 魏玉琴, 丁进杰, 张漫漫*

中国石油大学(华东)信息与控制工程学院, 山东 东营 257061

The research on the influence of wavelet phase on the inversion results of reflection coefficient sequences by using the ARMA model of symmetrical mapping Pole-Zeros

ZHANG Ya-Nan, DAI Yong-Shou, CHEN Jian, WEI Yu-Qin, DING Jin-Jie, ZHANG Man-Man*

College of Information and Control Engineering, China University of Petroleum, Dongying Shandong 257061, China

摘要

参考文献

相关文章

Download: [PDF](#) (4702 KB) [HTML](#) (0 KB) Export: [BibTeX](#) or [EndNote](#) (RIS) [Supporting Info](#)

摘要

为研究地震子波相位对反射系数序列反演的影响,在自回归滑动平均(ARMA)模型描述子波的基础上,提出采用z域对称映射ARMA模型零极点的方法构造了一系列相同振幅谱、不同相位谱的地震子波,并结合谱除法对人工合成地震记录进行反射系数序列反演.理论分析表明,子波相位估计不准时反射系数序列反演结果中残留一个纯相位滤波器,该纯相位滤波器的相位谱为真实子波和构造子波的相位谱之差.采用丰度和变分作为评价方法,在反演结果中确定出真实的或准确的反射系数序列.仿真实验和实际数据处理结果也验证了子波相位对反射系数序列反演的影响规律和评价方法的有效性,为进一步提高反射系数序列反演结果精度指明了研究方向.

关键词 地震子波, 反射系数序列反演, 纯相位滤波器, 自回归滑动平均模型, 评价方法

Abstract:

In order to research the influence of seismic wavelet phase on reflection coefficient sequences inversion, the autoregressive moving average (ARMA) model was used to describe the seismic wavelet, the wavelets with the same amplitude spectrum and different phase spectrums were constructed by symmetrical mapping Pole-Zeros of ARMA model in z domain, and spectrum division was used to implement reflection coefficient sequences inversion. The theoretical analysis shows that a pure-phase filter was remained after reflection coefficient sequences inversion in the condition of inaccurate seismic wavelet phase estimation, and the phase spectrum of the pure-phase filter was the phase spectrum difference between real wavelet and constructed wavelet. The real or accurate reflection coefficient sequences were identified in inversion results by the evaluation methods of Kurtosis and Variation. Simulation and actual seismic data processing results also verified the law of the wavelet phase influence on reflection coefficient sequences inversion and the effectiveness of the evaluation methods. Research interest for enhancing the precision of reflection coefficient sequences inversion results was indicated.

Keywords Seismic wavelet, Reflection coefficient sequences inversion, Pure-phase filter, Autoregressive moving average (ARMA) model, Evaluation method

Received 2012-04-06:

Fund:

国家自然科学基金(40974072)资助; 山东省自然科学基金(ZR2010DM14)资助; 中央高校基本科研业务费专项资金(12CX06072A); 中国石油大学(华东)研究生创新工程项目(CX2013062)资助.

Corresponding Authors: 戴永寿,男,1963年生,博士,教授,主要从事地震勘探信号处理方面的研究. E-mail: daiys@upc.edu.cn Email: daiys@upc.edu.cn

About author: 张亚南,男,1987年生,在读博士生,主要从事地震勘探信号处理方面的研究. E-mail: ufo995-ufo@163.com

Service

- [把本文推荐给朋友](#)
- [加入我的书架](#)
- [加入引用管理器](#)
- [Email Alert](#)
- [RSS](#)

作者相关文章

- [张亚南](#)
- [戴永寿](#)
- [陈健](#)
- [魏玉琴](#)
- [丁进杰](#)
- [张漫漫](#)

链接本文:

<http://manu16.magtech.com.cn/geophy/CN/10.6038/cjg20130625>

或

<http://manu16.magtech.com.cn/geophy/CN/Y2013/V56/I6/2043>

[查看全文](#) [下载PDF阅读器](#)

Copyright 2010 by 地球物理学报