

应用地球物理学

横向各向同性介质弹性波多分量叠前逆时偏移

杜启振<sup>1,2</sup>, 秦童<sup>1,2</sup>

1 中国石油大学(华东)地球资源与信息学院, 东营 257061

2 中国石油大学中国石油天然气集团公司物探重点实验室, 北京 102249

收稿日期 2008-6-11 修回日期 2009-1-23 网络版发布日期 2009-3-20 接受日期

**摘要** 随着油气勘探程度的提高, 隐蔽油气藏在增储上产方面起到了重要作用, 因此发展基于各向异性介质的多分量偏移方法是非常必要的. 本文基于横向各向同性(VTI)介质, 从二维弹性波速度\|应力方程出发, 通过在时间上的二阶差分 and 空间上的交错网格高阶差分对方程进行离散, 得到弹性波交错网格高阶差分的多分量逆时偏移算子. 在激发时间成像条件的应用过程中引入Poynting矢量进行成像并消除逆时偏移所引起的低频干扰, 在此基础上实现了VTI介质中二维弹性波叠前多分量逆时深度偏移. 理论模型的偏移处理表明, 该方法能够对地层进行准确成像, 并可以消除逆时偏移所引起的低频噪声.

**关键词** [成像条件](#) [Poynting矢量](#) [多分量](#) [逆时偏移](#) [交错网格](#) [VTI介质](#) [速度-应力方程](#)

分类号 [P631](#)

DOI:

Multicomponent prestack reverse-time migration of elastic waves in transverse isotropic medium

DU Qi-Zhen<sup>1,2</sup>, QIN Tong<sup>1,2</sup>

1 Faculty of Earth Resource and Information, China University of Petroleum, Dongying 257061, China

2 CNPC Key Laboratory of Geophysical Exploration, China University of Petroleum (Beijing), Beijing 102249, China

Received 2008-6-11 Revised 2009-1-23 Online 2009-3-20 Accepted

**Abstract** With the development of exploration in the mature exploration areas, the subtle trap is playing a dominant role. So, joint migration of multicomponent in anisotropic media is the key technology. This paper provided a full 2-D elastic prestack reverse time depth migration algorithm for common-source multicomponent data from VTI media. Extrapolation used the coupled anisotropic velocity-stress equation for variable velocity solved with a high order staggered grid finite-difference scheme in space and a second-order finite-difference scheme in time. A new imaging condition combined excitation-time imaging condition with Poynting vector was proposed to remove low-frequency artifacts. The algorithm was illustrated by application to synthetic data. The results show that this approach produces clear images and can remove low-frequency noises.

**Key words** [Imaging condition](#); [Poynting vector](#); [Multicomponent](#); [Reverse-time migration](#); [Staggered grid](#); [VTI medium](#); [Velocity-stress equation](#)

通讯作者:

杜启振 [duqizhen@tsinghua.org.cn](mailto:duqizhen@tsinghua.org.cn)

作者个人主页: 杜启振<sup>1,2</sup>; 秦童<sup>1,2</sup>

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF \(8339KB\)](#)

▶ [\[HTML全文\] \(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [引用本文](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“成像条件”的 相关文章](#)

▶ 本文作者相关文章

• [杜启振](#)

•

• [秦童](#)

•

•