

用转换函数方法研究喜马拉雅地区速度结构

王卫民¹, 苏有亮^{1, 2}, 高星¹, 郭志^{1, 2}

1 中国科学院青藏高原研究所, 北京 100085

2 中国科学院研究生院, 北京 100049

收稿日期 2008-4-16 修回日期 2008-7-25 网络版发布日期 2008-11-17 接受日期

摘要 利用流动数字地震台网提供的三分量地震波形记录, 应用转换函数及快速模拟退火算法对喜马拉雅山脉地区46个地震站下的地壳横波速度结构进行了反演, 为进一步揭示青藏高原喜马拉雅山脉地区的动力学演化过程提供了可靠的地球物理证据. 根据本文结果可清晰看到, 喜马拉雅山脉地区作为当今天壳活动最活跃的地区, 物质交换非常活跃, 地下结构远远未达到平衡, 地壳速度有很大差异, 在板块边界处莫霍界面速度间断不是非常明显, 自喜马拉雅南坡向高原腹地, 地壳厚度大致从55 km增加到80 km; 沿经度方向, 莫霍面也有一定的起伏. 通过研究得到另外一个证据是, 在喜马拉雅的主中央逆冲断裂, 由大陆碰撞产生的主要构造, 其深度可能要大于80 km.

关键词 [波形反演](#) [速度结构](#) [转换函数](#) [模拟退火](#) [喜马拉雅](#)

分类号 [P315](#)

DOI:

A study of the velocity structure beneath Himalaya mountain chain region using transform function method

WANG Wei-Min¹, SU You-Liang^{1,2}, GAO Xing¹, GUO Zhi^{1,2}

1 Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing 100085, China

2 Graduate University of Chinese Academy of Sciences, Beijing 100049, China

Received 2008-4-16 Revised 2008-7-25 Online 2008-11-17 Accepted

Abstract According to the three-components teleseismic records from portable digital seismic station deployed in Himalaya mountain chain region, the S-wave velocity structure beneath 46 teleseismic stations are investigated by using transform function method and SA technique. As reliable geophysics evidence, these results help us to understand the geodynamic process of Himalaya mountain region of Tibet. This paper presents Moho topography beneath Himalaya mountain chain region, which indicates tectonic movement and substance exchange are active in the plate boundary regions where the crust remains in the state of imbalance. Although the crustal velocity has significant variation, but Moho velocity discontinuity is not obvious in the plate boundary region. From Himalaya southern slope to hinterland of Tibetan plateau the crust thickness increase from 55 km to 80 km. The Moho have a slight variation along longitude direction. Another evidence that we infer from this study is the tectonics at the MCT formed by the collision of two plate may extend to 80km depth.

Key words [Waveform inversion](#); [Velocity structure](#); [Transform function](#); [SA method](#); [Himalaya mountain chain region](#)

通讯作者:

王卫民 wangwm@itpcas.ac.cn

作者个人主页: 王卫民¹; 苏有亮^{1;2}; 高星¹; 郭志^{1;2}

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF](#) (5619KB)

▶ [\[HTML全文\]](#) (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“波形反演”的 相关文章](#)

▶ 本文作者相关文章

• [王卫民](#)

• [苏有亮](#)

•

• [高星](#)

• [郭志](#)

•

—