地球物理学报 » 2013, Vol. 56 » Issue (2) :493-503 doi:10.6038/cjg20130213
地震学★地球动力学★重力学★地磁学

引用本文(Citation):
沈旭章.2010年玉树7.1级地震震源区P和S波接收函数成像. 地球物理学报, 2013,56(2): 493-503,doi: 10.6038/cjg20130213

SHEN Xu-Zhang.Imaging structures of crust and upper mantle beneath the source of the 14 April 2010 Yushu, Qinghai earthquake using P- and wave receiver functions.Chinese Journal Geophysics,2013,56(2): 493-503,doi: 10.6038/cjg20130213

2010年玉树7.1级地震震源区P和S波接收函数成像

沈旭章*

中国地震局兰州地震研究所, 兰州 730000

Imaging structures of crust and upper mantle beneath the source of the 14 April 2010 Yushu, Qinghai earthquake using P and S- wave receiver functions

SHEN Xu-Zhang*

Lanzhou Institute of Seismology, China Earthquake Administration, Lanzhou 730000, China

摘要 参考文献 相关文章

Download: PDF (3720 KB) HTML (0 KB) Export: BibTeX or EndNote (RIS) Supporting Info

摘要

利用玉树固定地震台站和7个流动宽频带地震台站远震P波和S波接收函数,对2010年4月14日发生M_S7.1级地震的玉树地震震源区下方地壳及上地幔顶部速度结构进行了成像.结果表明:研究区下方存在明显的双地壳结构;主震所在的金沙江缝合带可能错断了地壳和岩石圈;错断的地壳在印度板块向北的推挤下,发生了叠置,导致金沙江缝合带下方呈现双地壳结构;根据发生在金沙江缝合带上的历史地震进一步推断,印度板块对金沙江缝合带这种深大走滑断裂的向北推挤,为断裂带上大地震的发生提供了闭锁条件,这可能是巴颜喀拉地块周边地震孕育的一种典型的深部地球动力学模式;在玉树地震主震区所在深度附近,发现局部存在高速夹层,这种局部高速结构,可能是积累引力,孕育地震的一个重要原因.

关键词 玉树地震, P和S波接收函数成像, 双地壳

Abstract:

P- and S- wave receiver functions of 1 permanent and 7 temporary seismic stations are used to image the structures of the crust and upper mantle beneath the source of the M_S7.1 earthquake that occurred on 14 April 2010 in Yushu, Qinghai. The results indicate the obvious presence of a double Moho structure beneath the study region. In addition, the Moho and lithosphere were likely offset by the Jinsha River suture at which the main shock occurred. The faulted crust has been pushed to the north by the Indian plate, leading to the doublet Moho. From historical earthquakes on the Jinsha River suture, we infer that the faults along the Jinsha River suture were locked by the India's push, which is probably a model for the seismogenic mechanism around the Bayan Hara block. Local high-velocity layers are found at depth around the main shock source, and such structure might accommodate stress accumulation and release to generate major earthquakes.

Keywords Yushu earthquake, P- and S- wave receiver function image, Double Moho

Received 2012-08-19;

Fund:

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
沈旭章