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鄂尔多斯地块东南缘地带Moho深度变化特征研究

任枭[1,2], 徐志国[2], 杨辉[2], 陈宏峰[2], 邹立晔[2]*

1. 中国地震局地球物理研究所,北京 100081;
2. 中国地震台网中心,北京 100045

Moho depth distribution character beneath the Ordos block's southeastern margin areas

REN Xiao[1,2], XU Zhi-Guo[2], YANG Hui[2], CHEN Hong-Feng[2], ZOU Li-Ye[2]*

1. Institute of Geophysics, China Earthquake Administration, Beijing 100081,China;
2. China Earthquake Networks Center, China Earthquake Administration, Beijing 100045,China

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摘要

鄂尔多斯地块东南缘是主要的历史强震活跃区,曾经多次发生6级或以上的强烈地震,其边缘边界具有较强的地震活动性.本文利用该区域内分布的固定台站数据记录的大量远震体波波形资料,应用频率域反褶积方法提取远震P波接收函数,由*H*-*κ*方法测定了各台站下方的Moho深度和V_p/V_s值.研究结果表明:鄂尔多斯地块东南缘的V_p/V_s值介于1.6~1.9之间.东缘的Moho深度介于33.4~45 km之间,太原断陷盆地附近的Moho深度较浅,最浅处为33.4 km;东部北段的延怀盆地、蔚县盆地、阳原盆地和南段的临汾盆地附近Moho深度变化不大,平均深度为40 km.而在东缘东侧,因存在着山西断陷带,导致块体边缘的Moho深度要小于块体内部的Moho深度.块体南缘的Moho深度介于31.0~53.1 km之间,自东段向西段Moho深度逐渐变大,从渭河盆地附近的31.0 km增厚至秦岭造山带地段的53.1 km.总之,鄂尔多斯地块东南缘地带的Moho深度和V_p/V_s值分布具有明显的分块特征,块体内部结构比较稳定,东缘东段地壳结构相对一致,东缘东侧与西侧地壳深度具有明显的差异性,从山西断陷以东向西地壳厚度逐渐增厚,很好地对应了其地质构造特点.

关键词 接收函数, 固定台站数据, Moho深度, 地质构造

Abstract:

The Ordos Block's Southeastern Margin areas are a region of strong historical earthquakes where had happened a few strong earthquakes above magnitude 6.0, so these areas have strong seismicity. We selected broadband teleseismic waveform data recorded by the permanent stations spread over Ordos Block's Southeastern Margin areas to get P wave receiver function using deconvolution in Frequency Domain, then the Moho depth and V_p/V_s ratio in the Ordos block's Southeastern Margin Areas are estimated by teleseismic receiver function using *H*-*κ* method.Our study shows that the velocity ratio in this region is between 1.6 and 1.9, and the Moho depth beneath the Eastern areas is between 33.4~45 km. The lowest Moho depth of the areas lies in Taiyuan basin and it is about 33.4 km. Around Yanhuai basin, Weixian basin, Yangyuan basin and Linfen basin, the Moho depth is about 40 km. The Moho depth beneath the southern areas is between 31.0~53.1 km, and gradually increases from eastern areas to western areas. Therefore, the Moho depth and the velocity ratio show strong lateral variations with geological structure in the areas.

Keywords Receiver function, Permanent stations, Moho depth, Geological structure

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Corresponding Authors: 徐志国,男,1980年生,硕士研究生.E-mail:xuzhg@seis.ac.cn Email: xuzhg@seis.ac.cn

About author: 任枭,女,1980年生,硕士研究生,主要从事地震资料解释方面的研究.E-mail:renx@seis.ac.cn

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