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中国东北—华北地区地壳厚度与泊松比及其地质意义

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Crustal thickness and V_p/V_s in the Northeast China-North China region and its geological implica

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摘要

本文通过收集和综合分析已有的接收函数*H-k*研究结果，给出了中国东北—华北地区的地壳厚度与波速比/泊松比分布图.本研究表明区地壳最薄的地方出现在松辽盆地和华北平原地区（28~35 km）；大兴安岭、燕山—太行地区的地壳厚度介于36~45 km范围，中燕山造山带地壳厚度由东向西逐渐增加；而最厚的地方则出现在鄂尔多斯盆地西南缘（~55 km）.研究区平均波速比为1.76±0.05，较全球大陆平均值明显偏高，这可能与中、新生代以来该区显著的岩石圈减薄与破坏过程相关.其中地壳波速比最高的地方出在山西地堑、长白山、大同—张家口等新生代火山区，意味着这些地区可能具有较高的地壳温度或存在广泛的壳内部分熔融.本文研显示，大兴安岭造山带地区地壳厚度与波速比/泊松比成负消长关系，推测大兴安岭在形成过程中，地壳的增厚以长英质上地壳增厚主.与大兴安岭地区不同，松辽盆地及周边地区地壳厚度与泊松比没有明显的相关性，表明松辽盆地可能具有复杂的形成与演化过程

关键词 地壳厚度, 波速比, 中国东北—华北, 岩石圈破坏/减薄

Abstract:

We present a crustal thickness and V_p/V_s map of Northeast and North China based on a compilation of receiver function *H-k* analysis published in the literature. Our compilation shows that the thinnest crust is found beneath the Songliao Basin and North China plain (28~35 km), while the thickest crust is found in the Southeast edge of the Ordos basin (~55 km). Slightly thick crust (36~45 km) is seen in Da Hinggan Ling and Yanshan-Taihang orogenic belts, and the crustal thickness gradually increases from east to west. The average crustal V_p/V_s ratio about 1.76±0.05 for the North China and Northeast China region, which maybe related with the lithospheric thinning in eastern China. The highest V_p/V_s (>1.83) are found in the Shanxi graben, Changbai Volcano and Zhangjiakou-Datong, indicating high ambient crustal temperatures or wide-spread intra-crustal melting. The existence of anticorrelation between V_p/V_s and the crustal thickness in Da Hinggan Ling area may be related wi tectonic thickening of felsic crust. No clear correlation is observed between the crustal thickness and V_p/V_s for Songliao basin and adjacent area, implying that complex tectonic evolution process took place in Songliao basin

Keywords Crustal thickness, V_p/V_s, NE China-North China, Lithospheric destruction/thinning

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