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首都圈地区莫霍面起伏及沉积层厚度

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摘要 利用首都圈数字地震台网宽频带和短周期记录提取了接收函数，用H\|Kappa叠加方法反演得到了台站下方地壳厚度和泊松比.反演结果显示首都圈地区莫霍面的区域构造方向呈北东或北北东向展布，地壳由东南向西北方向逐渐增厚，平均厚度为34 km.地壳泊松比分布呈现出分块的特征，泊松比高值区对应于岩石比较破碎的多条活动断裂带交汇区.而某些地区堆积有较厚的低速松散沉积层，其下的结晶基底介质速度相对较高，因此，该界面造成径向直达P波能量非常弱，而紧随其后的转换波能量较强，称其为首到波峰.通过正演计算，建立首到波峰和直达P波到时差与沉积层厚度的定量关系，从而可根据首到波峰相对于直达P波的时间延迟来快速判定沉积层的大致厚度.

关键词 接收函数 莫霍面 沉积层 首都圈地区

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Moho depth and sedimentary thickness in Capital region

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Abstract Receiver functions are calculated with teleseismic P waveforms recorded by broad-band and short period stations of the Capital Digital Seismic Network, then the thickness and Poisson ratio of crust are investigated with the H-Kappa method. The inversion results demonstrate that the crust thickens gradually from SE to NW with an average thickness of 34 km. The crustal Poisson ratios which are indicative of different tectonic regions, have a good correlation with the active faults. The regions with high Poisson ratios fall into the cross zone of active faults with cracked rocks. Because the velocity of the basement is much higher than that of sedimentary layer, the radial direct P wave propagating through the sedimentary layer becomes very weak as compared to the converted multiple phase in the sedimentary layer. At typical periods the first arriving energy consists of the direct P and the secondary conversion phases, and produces apparent delay of peaks. The quantitative relationship between the delay times of first arriving energy relative to direct P wave and the thickness of sediments was established by forward calculation, which enables to quickly estimate the sediment thickness by the delay times of the first arrival pulse.

Key words Receiver function;Moho depth;Sedimentary layer;Capital region

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