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论文

拜城—大柴旦剖面的上地壳Q值结构

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摘要: 利用横跨塔里木盆地、阿尔金造山带和柴达木盆地的拜城—大柴旦综合地球物理剖面的人工地震宽角反射/折射资料, 对拜城—大柴旦剖面研究区上地壳的Q值结构进行了反演. 结果表明, 研究区上地壳的Q值结构具有明显的分层性, Q值随深度的加大而增大; 横向对应的不同地质构造单元的Q值具有不同的分布特点. 塔里木盆地的上地壳具有稳定的Q值结构, 但盆地北缘(特别是库车坳陷)的Q值比南缘的低, 表明北缘的介质比较破碎. 这可能与盆地北缘活跃的构造特征与巨大的沉积厚度有关, 是引起盆地南北两侧地震活动性差异(北缘强, 南缘弱)的重要原因之一. 阿尔金造山带上地壳的平均Q值较高(约500), 这可能由于结晶基底埋藏较浅, 基岩出露, 因此地震波在此处传播能量衰减较慢所致. 柴达木盆地西半部分上地壳的Q值除了表层的(厚1.0~2.0km)较高外, 其余各层的Q值与塔里木盆地中部的相当(平均约400), 显示了与塔里木盆地相似的稳定构造.

关键词: 阿尔金造山带 Q值结构 反演 柴达木盆地 塔里木盆地

Q VALUE STRUCTURE OF THE UPPER CRUST ALONG THE PROFILE FROM BAICHENG TO DA QAIDAM

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Abstract: The inversion for the Q value of the upper crust along the profile from Baicheng to Da Qaidam has been carried out using seismic reflection/refraction data acquired on the profiles which cross the Tarim basin, the Altun orogenic belt and the Qaidam basin, respectively. The results indicate that the Q value of the upper crust of the profile bears an obvious stratification, and a trend of value increasing downward. Laterally, the Q value has different features at different geological units. The upper crust of the Tarim basin has a stable Q value structure, but its value at the northern margin (especially the Kuqa depression) is relatively lower than that at its southern margin, indicating a fractured medium at the northern margin. Probably it is associated with the active structure and huge sedimentary thickness of the northern margin of the basin, and one of the reasons for the seismicity difference between the north and south sides of the basin (strong in north and weak in south). The upper crust of the Altun orogenic belt has a high average Q value (about 500). It is likely caused by shallow depth of crystalline basement, outcrop of basement rocks, and slow attenuation of seismic wave. In the west part of the Qaidam basin, only the first layer (about 1.0~2.0km) of the upper crust has a high Q value. The Q values of other layers are similar to that of the middle Tarim basin (400 in average), showing that the western Qaidam basin has a stable structure like the Tarim basin.

Keywords: Altun orogenic belt Q value structure Inversion Qaidam basin Tarim basin.

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