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扇形边界条件下的龙门山壳幔电性结构特征

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Electrical resistivity structure of Longmenshan crust-mantle under sector boundary

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摘要

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摘要

沿甘肃碌曲—四川龙门山—重庆合川布设了长周期大地电磁剖面,对龙门山及邻区进行了壳幔电性结构探测,采用更直观合理的扇形边界条件下的反演算法对长周期大地电磁资料进行二维反演.该剖面电性结果揭示了自北西向南东岩石圈深部的若尔盖壳幔高阻块体、松潘壳幔低阻带、龙门山壳幔高阻块体和川中壳幔高阻块体电性结构特征;龙门山逆冲推覆构造带下方的龙门山壳幔高阻体显示为向北西延伸的楔形构造,推断龙门山及松潘—甘孜地块由于受青藏高原东缘和上扬子地块双向挤压,松潘—甘孜地块地壳物质向龙门山逆冲推覆,中下地壳至上地幔向下向南东俯冲,呈现上扬子地块西缘壳幔高阻楔形体插入青藏高原东缘的态势;初步认为上扬子地块西缘深部以松潘壳幔韧性剪切带作为中新生代以来的边界.

关键词 龙门山, 长周期大地电磁, 扇形边界, 电性结构, 楔形构造

Abstract:

A long period magnetotelluric profile along the Luqu-Longmenshan-Hechuan has been finished which helps to study the crust-mantle electrical resistivity structure in Longmenshan and its adjacent area, intuitive and reasonable 2-D inversion algorithm under sector boundary was adopted. The results of this profile has shown the crust-mantle high resistance belt in Ruergai, Longmenshan, central Sichuan and low resistance belt in Songpan from northwest to southeast. Longmenshan crust-mantle high resistance block shows up as wedge-shaped high resistance block stretching to northwest under the Longmenshan thrust belt. Due to bi-directional compression of East margin of Qinghai-Tibet plateau and upper Yangtze plate, Crust materials of Songpan-Ganzi massifs thrust to Longmenshan, and middle-lower crust and upper mantle slides toward southwest, presenting a trend that west margin of upper Yangtze plate in shape of wedge inserting into east brim of Qinghai-Tibet Plateau. It was initially thought that Songpan crust-mantle ductile shear belt is regarded as the west margin deep boundary of upper Yangtze plate since Mesozoic-Cenozoic Era.

Keywords Longmenshan, LMT, Sector boundary, Resistivity structure, Wedge structure

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