Crustal and upper mantle structure in eastern boundary of Tibet plateau by MT data

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Eastern boundary area of Tibet plateau is one of the significantly deformed and the most earthquake-active regions in china continent. There are many seismically active faults. MT data were obtained along a profile SMp of 145km long that started from Chuan-Dian (Sichuan province-Yunnan province) block (CDb), crossing Da-Xue-Shan block (DXSb) and ended in Central Sichuan block (CSb) with striking in NEE direction. The remote reference MT method and robust technique were used in the field measurement and data processing. The impedance tensor decomposition was carried out for study of local distortion of the data. The static correction factors was calculated for static shift data. 2-D electrical structure along profile was obtained by using topographic 2-D inversion method NLCG.

The electrical structure along MT profile can be divide into three segments corresponding to CDb, DXSb and CSb respectively. The similar layering crustal structure appears for CDb and DXSb which is great different from that of CSb. Three segments are separated by lithospheric faults, XA fault belt and EB fault belt respectively. The XA fault belt is discontinuous in middle crust that is possibly due to the detachment movement in middle crust that cuts off XA fault belt laterally.

The foci of earthquake were generally at depth less than about 20km that was just corresponding to the high resistivity layer in the upper crust.

The “pincelike” electrical structure of the crust west of EB can be compared to that of a parallel profile north of this profile (Sun, J.,et al, 2003). The later crossed XSH faults and Longmenshan faults.

The induction arrows in frequency band from 1 Hz to several hundreds Hz also indicates that the low resistivity layer exists in the middle crust agreeable to 2-D model and is more conductive in the region south of this profile.

The crustal structure along the MT profile is formed owing to three actions: southeastward movement of Tibet plateau, clockwise movement of the CDb and resisting force of stable CSb. But the detailed dynamic process and its relationship with seismic activity are still unclear and need further investigation.