

勘探地球物理

龙门山及邻区重、磁异常特征及与地震关系的研究

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摘要 本文通过研究龙门山构造带及邻区的区域重、磁场特征,以及龙门山断裂带的产状等特征,探讨其与地震关系.研究表明,龙门山断裂带是环绕青藏高原的重力梯度带的一部分.其对应密度分界面向西北方向倾斜,向下延深数十公里,切穿莫霍面.推测密度分界面分为两段,深部较陡的为岩石圈块体的边界,浅部较缓.基底隆起与凹陷的界线大体与大地构造单元的界线一致.由西部的岩石圈块体的边界至东部在地表的大地构造单元界线之间的距离约为40~50 km.隶属于中上地壳脆性变形层的地质体由岩石圈块体界线沿缓倾的密度界面推覆至地表的大地构造单元的界线处,在此过程中伴随岩层破碎,从而发生地震.龙门山构造带主要部分位于负磁异常区,这种反磁化和退磁的现象,可能与逆冲推覆作用所引起的深部岩层倒转有关.

关键词 [龙门山构造带](#) [汶川地震](#) [重力异常](#) [重力梯度带](#) [磁异常](#) [岩石圈块体](#)

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Relationship between characteristics of gravity and magnetic anomalies and the earthquakes in Longmenshan range and adjacent areas

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Abstract The gravity gradient belt in the Longmenshan fault zone is part of the great gravity gradient belt surrounding the Tibetan plateau in the north and the east. The density boundary plane, corresponding to the gravity gradient belt, exists beneath the surface. Based on seismic data, the immense boundary plane of density distribution might be extended downward several ten kilometers across the Moho. According to analysis for the Wenchuan earthquake and aftershocks, most of the earthquakes occurred in the upper and middle crust.

Therefore, we suggest that the immense boundary plane of density distribution might be divided into two parts in depth. The deeper part in the westernmost of the Longmenshan fault zone is the boundary of lithosphere blocks, which dips steeply toward northwest. In contrast the shallower part located in the upper and middle crust and dips gently northwest. The boundary of the shallower part at the surface coincides roughly with the Anxian-Guanxian fault, the easternmost one of the Longmenshan fault system. The distance is about 40~50 km between the boundary of lithosphere block and the Anxian-Guanxian fault. When brittle part of the continental block move along the density boundary surfaces from boundary of lithosphere block to the tectonic boundary on the surface and rupture, earthquake will occur.

The area around the Qingchuan-Wenchuan-Dujiangyan exhibits negative magnetic anomalies. [JP2] Thrust faulting resulted in the overturn of the strata, [JP] which in turn caused reversal magnetization.

Key words [Longmenshan fault zone](#); [Wenchuan earthquake](#); [Gravity anomaly](#); [Gravity gradient belt](#); [Magnetic anomaly](#); [Lithosphere block](#)

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