

兰州至玛曲地区地应力测量与现今构造应力场特征研究

吴满路^{1,2}, 马寅生^{1,2}, 张春山^{1,2}, 廖椿庭^{1,2}, 区明益²

1 国土资源部新构造运动与地质灾害重点实验室

2 中国地质科学院地质力学研究所, 北京 100081

收稿日期 2007-7-27 修回日期 2008-6-13 网络版发布日期 2008-9-17 接受日期

摘要 兰州—玛曲地区是印度板块北东向推挤引起青藏块体强烈变形的前缘区, 该区的现今构造应力场研究对研究大陆动力学问题具有重要意义. 本文给出了兰州—玛曲地区不同地点的现今地应力实测值的大小和方向. 测量方法采用压磁应力解除法, 测点分别布置在阿姨山、大水、尕海、玛艾以及清水. 为系统研究本区及邻近地区现今构造应力场特征, 对已有应力实测数据进行了整理分析. 研究结果表明, 本区及邻区几十米浅表部应力与其他地区相比, 属于中等大小量值; 应力随深度增加而加大, 但在不同构造单元, 应力增加梯度有所不同; 最大水平主应力方向总体上为北东向, 不同构造单元上方向有所不同, 鄂尔多斯地块最大水平主应力方向为近东西向, 河西走廊带最大水平主应力方向在北北西—北东方向内变化, 祁连山东南端最大水平主应力方向变化较大, 西秦岭地块是现今地应力的一个过渡带, 最大水平主应力方向由北侧的NE向逐渐转变为中部的EW向和南侧的SEE向. 本文给出的结果与由GPS观测给出的该区域应变场分布具有一致性.

关键词 [兰州—玛曲地区](#) [地应力测量](#) [构造应力场](#)

分类号 [P553](#)

DOI:

In-situ stress measurement and tectonic stress field study in the region of Lanzhou-Maqu

WU Man-Lu^{1,2}, MA Yin-Sheng^{1,2}, ZHANG Chun-Shan^{1,2}, LIAO Chun-Ting^{1,2}, OU Ming-Yi²

1 Rey Laboratory of Neotectonic Movement & Geohazard

2 Institute of Geomechanics, Chinese Academy of Geological Science, Beijing 100081, China

Received 2007-7-27 Revised 2008-6-13 Online 2008-9-17 Accepted

Abstract The study region is a strongly deformed area of the east margin of the Tibet plateau due to the northeastward compression of Indian plate. A study on the recent state of stress in the plateau provides basic data for research of continental dynamics. The values and directions of the ground stress at several sites of Lanzhou-Maqu area are given in the paper using piezomagnetic stress gauge overcoring method. The measurement sites are situated in Ayishan, Dashui, Gahai, Ma' ai and Qingshui. The previous stress data are also analyzed for studying the tectonic stress field in the region of Lanzhou-Maqu and its adjacent area. It is shown that the values of ground stress in depths less than 100m are medium as compared to that in other areas, and increase with depth, the increase rate differs in different tectonic units. The overall direction of maximum principal stress is northeast with a small variation in different tectonic units. The direction of maximum principal stress is nearly west-east in Ordos block, NNW-NE in Hexizoulang. The changing of maximum principal stress direction is maximum in the southeast part of Qilanshan mountain. The west Qinling mountain is a transition zone of ground stress direction. The direction of maximum principal stress is changed gradually from NE in north to EW in middle part and SEE in south. The results agree with the results from GPS observation in this area.

Key words [The region of Lanzhou-Maqu](#); [In-situ stress measurement](#); [Tectonic stress field](#)

通讯作者:

吴满路 wumanlu@126.com

作者个人主页: 吴满路^{1,2}; 马寅生^{1,2}; 张春山^{1,2}; 廖椿庭^{1,2}; 区明益²

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF](#) (869KB)

▶ [\[HTML全文\]](#) (0KB)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [引用本文](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“兰州—玛曲地区”的相关文章](#)

▶ [本文作者相关文章](#)

• [吴满路](#)

•

• [马寅生](#)

•

• [张春山](#)

•

• [廖椿庭](#)

•

• [区明益](#)