西秦岭北缘断裂带漳县—车厂断层的结构及构造演化

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中文摘要:西秦岭北缘断裂带是青藏高原东北缘主要构造边界断裂带之一, 其构造变形历史和运动学特征研究可以为西秦岭中新生代构造过程和印度—亚洲板块碰撞动力学的远程构应提供约束。漳县—车厂断层是西秦岭北缘断裂带的重要组成部分, 通过对工程开挖所揭露的断层带内丰富构造现象的观测与分析, 至少可以辨别出3期性质、规模、运动学特征各异构造变形事件。第一期为向北北东陡倾的伸展正断层作用; 第二期为向南南西倾的由南向北的逆冲断层作用; 第三期为沿近直立断面左旋走滑作用。尽管每期变形的时代尚缺乏构造测年的约束, 但根据其与白垩系、新近系的空间关系以及已有第四纪以来沿断层地貌位错和相关沉积物测年以及地震活动历史研究对断层左旋走滑作用的时代约束, 认为第一期伸展层作用起始于早白垩纪, 可能持续到渐新世; 第二期向北逆冲断层作用起始于渐新世初, 可能持续到早第四纪; 第三期左旋走滑断层作用起始于晚第四纪, 持续至今。漳县—车厂断层是条典型的多期变形的脆性断层, 其变形特征与历史, 如果代表了西秦岭北缘断裂带特征与构造变形过程, 那么现今西秦岭北缘断裂带仅是起始于早白垩纪、新生的脆性断裂带, 并非是主造山期大规模韧性逆冲推覆作用的边界断层。

中文关键词:西秦岭北缘断裂带 漳县—车厂断层 断层带结构 断层运动学

The Components and Structures of the Zhangxian-Chechang Fault Zone in the North Margin West Qinling and Its Deformation History

Abstract:The north margin fault zone of West Qinling is one of the tectonic boundary faults and earthquake faults in the northeast margin of Tibetan plateau. Its structural characteristics and deformation history can provide important constraints on the Mesozoic-Cenozoic tectonic processes of West Qinling and the remote tectonic responses t Indian-Europe plate collisions. Based upon the tectonic observation and analysis of Zhangxian-Chechang fault zone which was uncovered by engineering construction and i located in the central segment of the north margin faults of West Qinling, the authors identified three phases of deformation events with different properties, scales, and kinematics. The first event is characterized by steep NNE-dipping extensional normal faulting. According to the relationship between Cretaceous red bed basin and the fault, suggested that this normal faulting event documented the Cretaceous regional crustal extension and development of the red bed basin. The fault gouge with a lot of grinding gravels and well-developed faulting foliations indicates its long duration, probably lasting to the Late Oligocene, i.e., 29 Ma when Linxia basin began developing. The second event is characterized by south-dipping inverse faulting, which led to the folding and thrusting of the Cretaceous red bed strata, possibly indicating the transition from crustal extension to contraction. This tectonic transition probably suggests that the India-Europe plate collision might have been spread to West Qinling, and strong thrusting should have occurred at 3.6 Ma when Jishishan and Wuquanshan conglomerates occurred. The third event is characterized by sinistral strike-slipping along the nearly vertical NNW striking fault plane, which began in Late Quaternary and has continued up till now. Zhangxian-Chechang fault as one of the north margin faults of West Qinling is a typical brit fault, which failed to document the large-scale ductile shearing in Indochina orogeny. Therefore it is held that the north margin fault zone of West Qinling, which has been