

The Tectonic Transformation and Movement Features Between Eastern Kunlun Active Fault Zone and Western Qinling Active Fault Zone, Northeastern Margin of Qinghai-Tibetan Plateau

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The Tectonic Transformation and Movement Features between Eastern Kunlun Active Fault Zone and Western Qinling Active Fault Zone, Northeastern Margin of Qinghai-Tibetan Plateau DAOYANG YUAN^{1, 2} WENGUI HE¹ PEI-ZHEN ZHANG^{2, 1}. Seismological Bureau of Gansu Province, Lanzhou 730000, China². State Key Laboratory of Earthquake Dynamics, Institute of Geology, CEA, Beijing 100029, China The Eastern Kunlun active fault zone and the Western Qinling active fault zone are important block-boundary fault zones in northeastern margin of Qinghai-Tibetan plateau. They are left-lateral strike-slip active fault zones in Holocene which had happened several strong earthquakes. Between them there are 3 secondary active fault zones, the Lintan-Tanchang, Guanggaishan-Dieshan and Diebu-Bailongjiang faults. The present work introduces briefly the tectonic transformation, movement features and present-day strong earthquake activity. The main points are as follows: (1) The area between Eastern Kunlun active fault and Western Qinling active fault, two left-lateral strike-slip faults, can be regarded as a huge left step rock bridge, their tectonic transformation by several secondary shear faults to realize, mainly include: the Lintan-Tanchang, Guanggaishan-Dieshan and Diebu-Zhouqu faults. They are nearly the same strike direction, about NW oriented. They appear to an arc shape extending to NE direction, have the character of reverse left-lateral strike-slip. (2) Along Eastern Kunlun fault, the left-lateral strike-slip rate of western segment reach 12~14mm/a, eastern segment reduce to 4~6mm/a and the average rate is about 9mm/a, but in the western Qinling active fault zone just only 3.0mm/a, the difference of about 6mm/a between them is realized balance and smoothed by the secondary strike-slip faults in the rock bridge. (3) This area is a highly active fault in seismicity. More than 10 earthquakes of magnitude 6.5 or larger had occurred at the main faults by historical records. The Eastern Kunlun fault occurred Huashixia earthquake(M₇ 1/2) in 1937 and the Kunlunshan pass earthquake(M_s8.1) in 2001 along the middle and west segment, but the east segment no historical earthquake records, the last paleo-earthquake event is about 1800a. B. C. The Western Qinling fault occurred several earthquakes in history, such as Tianshui 7 1/2 earthquake in 734 at the east segment, Gangu 7 1/4 earthquake in 143 at the middle segment, Kangle 6 3/4 earthquake in 1936 at the west segment et al. Along the 3 secondary faults, several middle-strong earthquakes had occurred. (4) An analysis of time-space of historical earthquakes and paleo-earthquake events suggests that the eastern segment of Eastern Kunlun active fault, the middle segment of Diebu-Bailongjiang fault and the middle segment of Western Qinling fault have relatively high possibility for earthquakes occurring in the future.