STYLE AND CONSEQUENCE OF STRAIN PARTITION IN THE NORTHEAST MARGIN OF QINGHAI-TIBET PLATEAU

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The Northeastern margin of Qinghai-Tibet plateau, here refers to the region bounded by Western Qinling fault zone and Longshoushan-Liupanshan tectonic zone, where obliquely compression deformation occurred with the NE-trending maximum principle axis of stress, with Ordos Massif to the east, Alaxa Block to the north, and Qinghai-Tibet plateau to the southwest. The main structure in this region is Haiyuan-Gulang transpression zone. It consists of a series of active faults: the Haiyuan fault zone, the Tianjingshan fault zone, the Yantongshan fault zone and the Niushoushan-Luoshan fault zone.

Geological mapping indicates that strain within this region is manifested not by transpressional faults but rather by paired fault-and-fold zone, and partitioning into domains of contraction and strike-slip. This surface strain partitioning style could be sustained by the deeper-structure and seismicity.

There're 2 transcurrent faulting-and-constructional couplets. One is Haiyuan strike-slip fault zone and Xingrenpu-Tianjingshan constructional zone, and the other couplet is Tianjingshan piedmont strike-slip fault zone and its forearc depressional basin as well as Yantongshan shrunk zone. Detail geological mapping within this region shows 7 distinct southeast-trending domains paralled to the main margin faults developed in Late Miocene and Quaternary, from southwest to northeast, there're (1) Haiyuan left-lateral strike fault zone, which we have reported, is about 60 km Left-lateral displacement since 8 ~ 10 Ma B. P. (Tian Qinjian et al, 1999); (2) Xingren-Tianjingshan constructional domain, at least 6 km shorting occurred; (3) Xiangshan-Tianjingshan piedmont left-lateral fault zone, more than 25 km displacement occurred along western segment of this fault zone, and at least 8 km left-lateral displacement occurred at Shapotou (Ding Guoyu, et al, 1999); (4) Zhongwei-Qingshuihe relatively undeformed forearc basin, but about 2.3 km shorting occurred by thrusting since 0.15 Ma B. P.; (5) Yantongshan construction domain, the total shorting amount is about 4 km; (6) Hongsipu relatively undeformed basin and (7) Niushoushan-Luoshan right-lateral marginal tectonic zone.

In late Cenozoic Era, 4 stages of strain partitioning are recorded which began respectively at 8~10 Ma B.P., 3.4 Ma B.P., 1.6 Ma B.P. and 0.15 Ma B.P. The 1st stage marked by initiation of strain partitioning in the region showing that pull-apart basin within Haiyuan fault zone and depression basin along Xiangshan-Tianjingshan piedmont fault zone; the 2nd stage marked by the initiation of 2 couplets deformation and Xiangshan-Tianjingshan piedmont strike-slip fault began deformation; the 3th stage marked by the NWW-trending seismic fault deformation instead of former NW-trending faults; and the 4th stage marked by local strain partitioning.

Key words: strain partition; style; consequence; the northeast margin of Qinghai-Tibet Plateau