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Cenozoic deformation in coupling regions on both sides of Tian Shan and its constraint on the mineralization of sandstone-type uranium deposits

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Huge-thick Mesozoic-Cenozoic sediment deposited in the coupling regions on both sides of Tian Shan (Figure 1), where Cenozoic deformations widely spread and was regard as a natural laboratory to study the coupling dynamics of basin and range, and also was one of favorable ore-prospecting areas for sandstone-type uranium deposits in China. Cenozoic deformation on both sides of Tian Shan shows a segmental similarity in EW-direction, displaying a special deformation pattern of rhombic symmetry. It transferred from range to basin, but the initiation time in south side was older than that in north, and the crustal shortening and its rate in south were larger than those in north. Intense Cenozoic basement thrust motion took place in north areas of Bogeda mountain, where several faults are still activation. In the front areas of the southwestern Tian Shan, Akesu to Atushi, three lows of thrust faults and fault-related folds displaced the Paleozoic-Mesozoic strata overlaying Quaternary conglomerates. Strike-slip faulting developed not only in the south of the eastern Tian Shan, Kuluke Tage, but also in the north of the western Tian Shan, Ilihabigaer mountain. Three or four pattern fold-thrust-fault belts developed, west of Urumuqi and east Dushanzi, in northern edge of Tian Shan. Similarly, series rows composed of folds and thrust systems grew on in the south front edge of Tian Shan, Kuche-Baicheng area. It was suggested that this deformation pattern are resulted from the far-distance effect of the collision and convergence afterward between the India and Asia block, and the early-preserved relative rigid pre-Paleozoic blocks and larger-scale fault systems within the Tian Shan orogeny probably led to formation

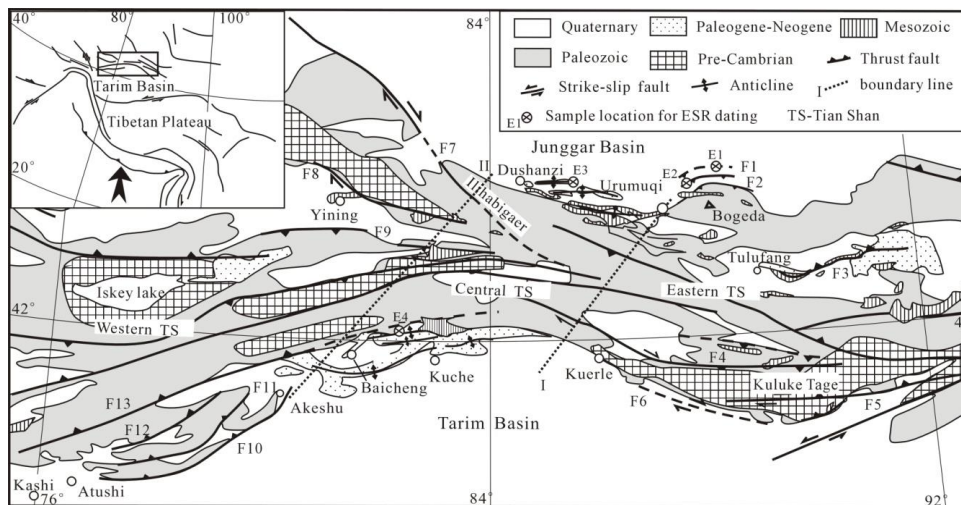


Figure 1: Simplified geological map of Tian Shan

of the Cenozoic deformation pattern of rhombic symmetry, which also controlled the distribution of sandstone-type uranium deposits. Coupling regions on both sides of central Tian Shan are more favorable for sandstone-type uranium mineralization than the other areas because of relative

stable tectonic movement. Early formed and later deformed uranium deposits, probably with appropriate preservation condition, are also possibly explored in central segment. The first-pattern

structural zone in front edge of the central Tian Shan should be one of the best ore-forming regions for sandstone-type uranium deposits. A new model named as Tectonic-prefer Controlling Ore-formation Model was proposed.

References:

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