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Syn-collisional or Post-collisional belt? In the view from the structure of the Middle Central Tianshan belt

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The Tianshan belt is one of the key regions in understanding the tectonics of the Central Asian Orogenic Belt (CAOB), because it presents a typical example for studying subduction, accretion and collision. Its tectonic evolution is recently in hot debate and draws more and more attention of the international geological society. As a major tectonic segment, the Middle Chinese Tianshan was considered to witness the most significant tectonic events. On the basis of structural analysis, three zones have been recognized namely: 1) the northern zone, composed of weakly metamorphosed sedimentary rocks of Silurian to Carboniferous age; 2) the central zone, comprised of well sheared amphibolite, marble, quartzo-schist, quartzite, garnet-biotite schist, and orthogneiss; and 3) the southern zone, which consists of amphibolite facies metamorphic rocks whose protolith is considered to be Silurian to Devonian. The most significant deformation was marked on the various schist or gneiss of the central zone. E-W striking, vertical or sub-vertical foliation with horizontal or sub-horizontal mineral and stretching lineations indicate conspicuous strike-slip shearing. Shear criteria indicate a dextral sense of shear. South-dipping foliation with northward thrusting in the northern zone and north-dipping foliation with southward thrusting in the southern zone show a large-scale flower structure related to the dextral strike-slip tectonics of the central zone. The absolute timing of the dextral strike-slip deformation is also discussed in the light of available radiometric dating. Our structural data emphasizes that the post-collisional dextral wrenching has largely modified the architecture of the Tianshan orogenic belt and played a critical role in the tectonic evolution of Central Asia.

