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Late-Paleozoic-Mesozoic deformational and deformation related metamorphic structures of Kuznetsk-Altai region

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Kuznetsk-Altai region is a part of the Central Asian Orogenic Belt. The nature and formation mechanisms of the observed structure of Kuznetsk-Altai region are interpreted by the author as the consequence of convergence of Tuva-Mongolian and Junggar lithospheric block structures and energy of collision interaction between the blocks of crust in Late-Paleozoic-Mesozoic period. Tectonic zoning of Kuznetsk-Altai region is based on the principle of adequate description of geological medium (without methods of "primary" state recovery).

The initial indication of this convergence is the crust thickening in the zone of collision. On the surface the mechanisms of lateral compression form a regional elevation; with this elevation growth the "mountain roots" start growing. With an approach of blocks an interblock elevation is divided into various fragments, and these fragments interact in the manner of collision. The physical expression of collision mechanisms are periodic pulses of seismic activity.

The main tectonic consequence of the block convergence and collision of interblock units is formation of an ensemble of regional structures of the deformation type on the basis of previous "pre-collision" geological substratum [Chikov et al., 2012]. This ensemble includes: 1) allochthonous and autochthonous blocks of weakly deformed substratum; 2) folded (folded-thrust) systems; 3) dynamic metamorphism zones of regional shears and main faults. Characteristic of the main structures includes: the position of sedimentary, magmatic and PT-metamorphic rocks, the degree of rock dynamometamorphism and variety rock body deformation, as well as the styles and concentrations of mechanic deformations.

1) block terranes have weakly elongated or isometric shape in plane, and they are the systems of block structures of pre-collision substratum separated by the younger zones of interblock deformations. They stand out among the main deformation systems, and the smallest are included into the deformation systems.

2) folded (folded-thrust) deformation systems combine deformation zones with relic lenses of Paleozoid substratum, and predominantly conform systems of the main faults. Despite a high degree of regional deformation the sedimentary-stratified and intrusive-contact relations of geological bodies are stored within the deformation systems, and this differs in the main the collision systems from zones of dynamic metamorphism.

3) regional zones of dynamic metamorphism of Kuznetsk-Altai region are the concentration belts of multiple mechanic deformations and contrast dynamometamorphism of complexes. The formational basis of dynamic metamorphism zones is tectonites of the collision stage. Zones of dynamic metamorphism attract special attention in the structural model of Kuznetsk-Altai region. They not only form the typical tectonic framework of collision sutures, but also contain the main part of ore deposits of this region.

Pulse mode of structure formation of Kuznetsk-Altai region is detected. Major collision events in Kuznetsk-Altai region were in the late-Carboniferous-Triassic time (307-310, 295-285, 260-250 and 240-220 Ma). This study was supported by a grant of the Russian Foundation for Basic Research (project nos. 14-05-00117).