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Structure and shear-sense indicators of the Mesoproterozoic basement of the North Tianshan microcontinent: Example of granitoid gneisses of the Karadjilga pluton, NW Kyrgyzstan

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The Mesoproterozoic Karadjilga pluton is a poorly studied fragment of the North Tianshan microcontinent located in the western Central Asian Orogenic Belt. Metasedimentary rocks surrounding the pluton consist of marbles and mica schists of the Mesoproterozoic Ortotau Group. These rocks constitute a major west-northwest trending syncline with steep to subvertical limbs. The hinge of the fold is well expressed in the west part of the syncline and plunges east with 30-40° angle of plunge. Eastern termination of the syncline is cut by faults. Granitoid gneisses and granites of the Karadjilga pluton crop out in the core of the syncline. The contacts of the pluton are sub-parallel to bedding and schistosity in surrounding rocks. Primary magmatic contacts are locally reworked by reverse faults and thrusts. Our detailed mapping and structural study revealed inhomogeneous deformation of rocks of the Karadjilga pluton. The following rock types are identified: 1) undeformed granite 2) foliated granite 3) granite-gneiss and 4) mylonite. Undeformed granites form <25-30% of total volume of the pluton and are most widespread in the northeast part of the pluton. On some geological maps they are shown as Ordovician or Devonian. However, U-Pb dating of 9 zircon grains by SHRIMP-II (VSEGEI, St. Petersburg, Russia) yielded a 1125±5 Ma concordant age. It agrees with previously reported U-Pb SHRIMP ages for deformed granites and gneisses (Degtyarev et al., 2011; Kröner et al., 2013) and indicates that undeformed granites belongs to the same Mesoproterozoic magmatic complex. Foliated granites and gneisses prevail and constitute up to 60-70% of total volume. They form west-northwest trending zones alternating with mylonites or undeformed granite. Mylonites are subordinate and occur mainly along the contacts of the pluton. Shear zones seem to be approximately parallel to the schistosity of deformed granites, but their geometry needs more study and mapping. Shear-sense indicators were studied in the oriented thin sections and are represented mainly by sigma and delta structures and oblique foliation with rare folds and other indicators. In all but one sample only strike-slip displacement has been identified. In the northern part of the pluton sinistral displacement predominates, whereas dextral displacement prevails in the southern part of the pluton. Shear zones are most widespread on the margins of the Karadjilga pluton, but locally also occur in the central part of the pluton, where they form narrow west-northwest trending zones. According to shear-sense indicators, displacement within the Karadjilga pluton occurred mainly in

the approximately west-east direction that strongly differs from the north-south sense of displacement in the Paleozoic thrust and fold belts of Tianshan.

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