

First tectonic-geomorphology study along the Longmu – Gozha Co fault system, Western Tibet: Insights on the youngest segment of the Altyn Tagh fault

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The Longmu – Gozha Co left-lateral strike-slip fault system (LGCF) is located in remote western Tibet, intersecting both the Altyn Tagh fault (ATF) and the Karakorum fault (KF), the two major strike-slip faults in the region. The Ashikule, the Gozha Co and the Longmu Co faults are clear and distinct left-stepping en-echelon faults, together forming the LGCF system. Although poorly documented, quantifying its activity remains a key problem to understand the kinematics and the tectonics history of the westernmost Tibetan Plateau. Indeed, the Karakax fault (westernmost segment of the ATF), LGCF and KF together control the tectonics of western Tibet which itself controls the extrusion of Tibet towards the east. The LGCF system shows clear and impressive morphological indications of left-lateral active shear, that we here attempt to quantify using field measurements (terrestrial LIDAR) along with ¹⁰Be surface-exposure dating. Our preliminary data suggest a slip-rate <3 mm/yr, consistent with geodetic and block model studies. While it is on the order of the Karakax fault slip-rate (~2 mm/yr), it is smaller than those along the ATF and KF (>9 and >8 mm/yr, respectively), yielding a possible ~4 mm/yr slip accommodated most likely in the Ashikule graben located between the ATF and Karakax faults, as well as along the thrusts in the south Tarim basin. In addition to evidence of recent tectonic-related events in the vicinity, such as the 1951 volcanic eruption, the 2008 and 2014 Mw7.3 Yutian earthquakes, the LGCF's en-echelon geometry, as well as relatively low slip-rate compared to those of the surrounding faults, suggests that this segment of the ATF may be the most recent, > 9-21 Ma.

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