



Constant slip rate of the Altygn Tagh Fault around Changma, Gansu, China over the late Quaternary

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Quantification of the strain distribution of the Altygn Tagh Fault in the northern Tibet, is of great importance for understanding the dynamics of the India-Eurasia collision. We determined time-averaged slip rate of the easternmost segment of the Altygn Tagh Fault around Changma in Gansu province by combining structural investigations, remote sensing and cosmogenic ^{10}Be surface exposure age data.

Quaternary alluvial fan deposits in the study area are displaced by left-lateral movement of the Altygn Tagh Fault and subsequently due to the accumulated displacement, some of them were beheaded from the possible debris-sourcing areas of the piedmont of Qilian Shan to the south. The displaced Quaternary alluvial fans consist of three sub-geomorphic surfaces. Q1 is the oldest alluvial fan of which the surface is ~ 40 m higher than the present stream. The gravels of Q1 are moderately weathered and its left-lateral offset were determined as ~ 400 m. Q2 surface is ~ 20 m higher than the present stream and its offset is up to ~ 130 m. The youngest geomorphic surface, Q3 is the present fluvial deposit superimposed on Q2. ^{10}Be surface exposure ages of Q1 and Q2 are 100-112 ka and 31-43 ka, respectively. The derived slip rates over the period of Q1 and Q2 deposition are of the same order as 3-4 mm/yr. Although our preliminary data challenge the previous assumption that the youngest alluvial fan deposits cut by active faults are younger than the Last Glacial Maximum in the northern Tibet, they support the suggestion that the slip rate prominently decrease toward the easternmost segment of the Altygn Tagh Fault caused by strain partitioning due to Qilian Shan thrust systems to the south.