The Qilian Shan large-scale restraining bend of north Tibet: shortening along Danghenan Shan accommodates strain transfer between Altyn Tagh and Haiyuan faults

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Résumé

New chronological data from cosmic ray nuclide dating of fans and terraces constrain the shortening rate along the northern piedmont of the Danghenan Shan (DHNS) in the western Qilian Shan. Reverse faulting and fault-bend folding characterize two major thrusts in the DHNS piedmont at the southern rim of the Yanchiwan basin. Leveling of the folded terraces reveal three main levels uplifted a few meters to about 70-80 meters. Cosmogenic isotope dating of these levels using both exposed surface cobbles and depth profiles indicate that these levels are coincident with the three major interglacials, from Holocene to MIS-7. Folded and uplifted terraces of this fold and thrust belt accommodate shortening that is transferred from the western Subei junction with the Altyn Tagh fault to the western extension of the Haiyuan fault south of Sulenan Shan. We emphasize the need for precise long-term slip rate determination and understanding of the three-dimensional structures of fault connections to evaluate strain transfer between faults and related seismic hazard on these continental scale complex fault systems.

Mots-Clés: restraining bend, North Tibet, cosmic ray nuclide dating, Danghenan Shan

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