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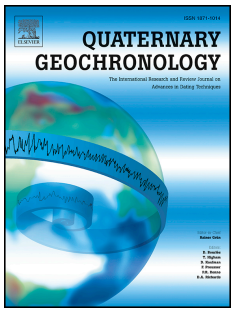

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Cosmogenic nuclide burial dating of an alluvial conglomerate sequence: an example from the Hexi Corridor, NE Tibetan Plateau

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Abstract

The thick alluvial conglomerate sequences around the Tibetan Plateau have been notoriously difficult to date. Here we use the cosmogenic nuclide burial dating method to date the Yumen and Jiuquan formations, a ~900 m thick fanglomerate found in the Hexi Corridor, the foredeep of the Qilian Shan, and exposed in the Laojunmiao anticline. We date 16 sites with simple burial dating and 2 sites with isochron burial dating, and use these dates to reinterpret the magnetostratigraphy of the section. We suggest that the bottom of the Yumen Formation, defined by a progressive unconformity, is around 5 My. Taking this timing as the initiation of anticline growth, the long-term crustal shortening rate at the ramp zone in western Qilian Shan is about 0.72 mm/yr, consistent with those obtained from middle and eastern Qilian Shan. The boundary between the Yumen and Jiuquan Formations is near ~1.2 My. Three other angular unconformities are dated to ~2.6-3.1, ~2.2-2.5, and ~1.2-1.7 My, respectively. Burial dating offers a robust chronology for these deposits, and when combined with paleomagnetic stratigraphy offers much tighter precision.

Keywords: Cosmogenic burial dating; Isochron burial dating; Alluvial conglomerate sequence; Hexi Corridor; Qilian Shan

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