



## **Magnetostratigraphy of the Northern Tian Shan foreland, Taxi He section, China**

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The Tian Shan range formed in the late Cenozoic in response to the northward propagation of deformation related to the India-Eurasia continental collision. Precise timing of the Tian Shan uplift is required to understand possible mechanisms of continental lithosphere deformation and interactions between climate, tectonism and erosion. Here, we provide magnetostratigraphic age control on the northern Chinese Tian Shan foreland successions. A thorough rock magnetic analysis identifies hematite and magnetite bearing alluvial deposits in the upper portion of the sampled stratigraphy as more reliable paleomagnetic recorders than magnetite bearing fluvial and lacustrine deposits that are often maghemitized in the lower part of the record. As a result, a robust correlation to the geomagnetic polarity time scale is obtained from 6 Ma to 2 Ma while a tentative correlation is proposed from 6 to 16 Ma. Sediment accumulation rates increase from 155 to 260 m/Myr at 3.9 $\pm$ 0.4 Ma. This change coincides with a gradual lithologic transition from fluvial (sandstone dominated) to alluvial (conglomerate dominated). This change is so drastic that it more likely corresponds to an approaching erosional source associated to tectonically increased subsidence rather than differential compaction alone. Clear evidences for growth strata starting at an estimated age of ca. 2 Ma provide a minimum age for the folding. These results are compared to previous magnetostratigraphic studies from the same and other section of the northern Tian Shan foreland deposits. This enables critical assessment of the reliability of magnetostratigraphic dating and the significance of sediment accumulation rate variations with respect to facies variations and growth strata. Our results in the Taxi He section provide a sequence of events that is consistent with enhanced tectonic forcing starting at  $\sim$ 4 Ma although a climatic contribution must be considered given the close relationship of these ages with the Pliocene climate deterioration.