

## Late Quaternary loess accumulation at the Rudak section in Uzbekistan, central Asia: Chronology and palaeoclimate implications

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Many studies have been carried out to understand the nature of the loess formation and its palaeoenvironmental significance in different parts of Eurasia, especially Europe and China. However, in spite of its key position, our knowledge about the loess deposits at the core of the Eurasian loess belt in central Asia is still limited, particularly in term of absolute dating. This study presents a new luminescence chronology of a loess-palaeosol sequence (Rudak section) in the vicinity of the Gissar Range, Uzbekistan, using both quartz optically stimulated luminescence dating and polymineral post-IR IRSL dating techniques. The dating results suggested a loess accumulation history over the past 180 kyr, but a great depositional hiatus during the entire last glacial period, likely owing to too harsh climate conditions for favouring dust deposition and loess preservation in the piedmont areas of central Asia. Hence, contrasting with the traditional concept of continuous (quasi-continuous) deposition of loess, the direct stratigraphical correlation might be problematic for climatic interpretation of loess-palaeosol sequence in this area. Furthermore, magnetic susceptibility of Rudak section demonstrated the moisture peaks in phase with ice-volume minima over the glacial and interglacial cycles, indicating moisture variation in the Westerlies dominated central Asia was broadly consistent with that in monsoonal Asia on orbital timescales, but nearly contrasting picture with each other on the suborbital timescales, at least through the Holocene. The Westerlies dominated central Asia has generally experienced a dry first-half and a wet second-half of the Holocene, which is likely triggered by solar insolation gradients between mid-latitudes and high-latitudes and meltwater flux.

Keywords: Loess-palaeosol sequence, Luminescence dating, sedimentary hiatus of loess, Moisture variations, Westerlies