

Mass accumulation rate and monsoon records from Xifeng, Chinese Loess Plateau, based on a luminescence age model - DTU Orbit (09/11/2017)

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Luminescence dating of loess accumulation in China has raised questions over disturbance and gaps in the record, the magnitude of mass accumulation rates (MARs), and monsoon forcing mechanisms. Here we present a detailed quartz optically stimulated luminescence (OSL) chronology from the Xifeng Chinese Loess Plateau site. We reconstruct MARs and construct an age model for monsoon proxies at the site. The luminescence ages show significant pedogenic and anthropogenic disturbance in material deposited after ca. 20–22 ka. Analysis of other published data suggests that this disturbance may be more common than previously realized. MARs from undisturbed portions of Xifeng vary dramatically, with peaks potentially matching the timing of Heinrich events. The last glacial maximum peak MAR (22–27 ka) matches the Pacific and Greenland dust flux records, although appears earlier than peak MARs seen in many other OSL-dated Loess Plateau sites. East Asian monsoon grain-size and magnetic susceptibility records also show several differences between independently dated loess sites. This complicates our understanding of any lag between insolation forcing and monsoon response. Nevertheless, the Xifeng climate proxy changes show apparent broad agreement with the timing of Heinrich events in the North Atlantic, supporting assertions of a climatic teleconnection between the two areas.

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