



Aeolian dust dynamics in Central Asia – driven by the long-term migration, seasonality and permanency of the Asiatic polar front

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Loess-palaeosol sequences preserve detailed archives of climate change, reflecting the dynamics of aeolian dust sedimentation and the palaeo-dust content of the atmosphere. The detailed investigation of particle size distributions of windblown sediments is an increasingly used approach to assess the palaeorecord of aeolian dust dynamics.

The Central Asian loess belt offers the potential to carry out granulometric studies and to reconstruct Pleistocene atmospheric circulation patterns in Eurasia. In this study we present the aeolian dust record of the loess sequence at Remisowka (Almaty, SE Kazakhstan), which reflects a detailed signal of glacial-interglacial dynamics in Central Asia. Based on radiocarbon and amino acid geochronologic data, long-term semi-continuous trends in the aeolian dust record of the Last Glacial Cycle are measured in order to interpret their palaeoclimate signal. In consideration of the modern synoptical atmospheric circulation patterns and aeolian dust transport in Central Asia, it is likely

that the observed trends reflect a long term signal of seasonality, triggered by changes in duration and permanency of the seasonal shift of the Asiatic polar front during the middle to late Pleistocene.

Previously published models, which focused on the glacial-interglacial reciprocity of the zonal Westerlies and Asiatic high in Central Asia, were overly simplified and should be modified to include the influence of the Asiatic polar front. As the position of the high level planetary frontal zone (HPFZ) mainly affects the development and seasonal shift of the Asiatic polar front, it is likely that an inter-hemispheric mechanism exists, that links dust deposition between Europe and Central Asia.