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Paleowind directions, paleosecular variation and relative paleointensity from the MIS 6 (L2) loess of Harletz, NW Bulgaria

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Loess (L) and paleosol (P) sequences represent continuous continental archives of environmental changes. Apart from their significance as paleoclimate archives, they may also record variations of the Earth's magnetic field at high temporal resolution. Confirming the reliability of loess sequences as recorders of geomagnetic secular variations (PSV) and relative paleointensity (RPI) would help build more accurate age models and improve the correlation with marine and lacustrine paleomagnetic records.
Here I will present a paleomagnetic study on the Harletz (NW Bulgaria) loess section, with a main focus on the exceptionnally thick L2 (MIS6) interval of the Lower Danube loess province. The main objectives will be to determine whether the Harletz sequence preserves a stable record of the relative paleointensity and the direction of the geomagnetic field and at the same time reconstructing paleowind dynamics and directions, using anisotropy of magnetic susceptibility (AMS).
Demagnetization with alternating field (AF) was performed on oriented samples from the S1, L2 and S2. The characteristic remanent magnetization (ChRM) directions were determined using principal component analysis (PCA). From the stable ChRM components a paleomagnetic direction (inclination and declination) is determined, which reflects the direction of the geomagnetic field during deposition and early diagenesis. A mean direction was calculated using Fisher statistics to assess directional consistency and stratigraphic trends.
RPI proxies were obtained using NRM normalized by ARM and IRM ratios. NRM depends on the strength of the geomagnetic field, the magnetic mineralogy, its concentration and the magnetic grain size distribution. Normalizing NRM by ARM or IRM, which respond differently to mineralogy, magnetic mineral concentration, and magnetic grain size distribution, should allow to isolate the relative variations in the intensity of the geomagnetic field. In parallel, AMS measurements provide constraints on the depositional fabric and dominant paleowind directions during loess accumulation.

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