A conceptual magnetic fabric development model for the Paks loess in Hungary

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We describe magnetic fabric and depositional environments of aeolian (loess) deposits from Paks, Hungary, and develop a novel, complex conceptual sedimentation model based on grain size and low-field magnetic susceptibility anisotropy data. A plot of shape factor (magnetic fabric parameter) and dry deposition velocity estimated from grain-size reveals primary and secondary depositional processes during the sedimentation of loess. Primary ones are driven by gravity, with poorly oriented MF for fine grain materials, and by tangential stress, with flow-aligned or flow-transverse fabric for coarser grain sediments. The fabric developed by a primary process is called depositional magnetic fabric. Secondary processes develop in unconsolidated sediments, beginning right after deposition and terminating before the start of diagenesis. Under slow sedimentation conditions, deposited materials are likely to be exposed near the surface for longer periods. Therefore, relatively strong winds with a stable direction can alter the fabric of non-buried surficial sediments. As a result, grain orientations may change from scattered, non-flow oriented fabric to flow-oriented fabric. This type of fabric, developed by a secondary process, is called transformed magnetic fabric, and is characterized by relatively welldefined grain orientation, which allows us to estimate a dominant wind direction.

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