Automated Dynamic Image Analysis (ADIA) of loess sediments from Harmignies, Belgium: a proxy for the intensity of climatic fluctuations?

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Transport and depositional processes lead to variations in size and shape of the sediments, according to parameters such as distance, duration and kind of transport. Climate affects sedimentation factors such as vegetation, weathering mechanisms, humidity, wind direction and strength. It can thus influence the transport mechanisms, and the source and origin of the sediments. Automated Dynamic Image Analysis (ADIA), defines size and shape of a large amount of sedimentary particles, by analyzing digital images, in a statistically relevant manner. Previous work, based on pedosedimentory characteristics, showed that during the last glacial period around 40 minor climatic fluctuations were identifiable in the Weichselian loess cover at Harmignies (Haine Basin, SW Belgium). ADIA investigations of 49 Weichselian loess samples, reveal no significant size or shape differences, linked with the minor climatic fluctuations. This could imply that the recorded minor climatic changes did not affect the source, origin and/or transport parameters of the sediment. Subsequently the whole Pleistocene succession in Harmignies is being investigated with ADIA to evaluate how size and shape of the loess paleosoil sediment responds to major climatic changes.