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Optically Stimulated Luminescence (OSL) dating of Weichselian sandur sediments from NE Germany – a comparison of results using medium aliquots, small aliquots and single grains of quartz

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Samples of fluvioglacial sands have been taken from outwash plains (sandur) with an unambiguous connection to the main ice marginal positions of the Weichselian glaciation in NE Germany. Previous studies (Lüthgens et al., 2009a/b) have shown that sandur sediments are prone to incomplete resetting of the OSL signal, as the depositional environment in such ice proximal positions was characterized by high sedimentation rates, short transport distances, and probably very cloudy meltwaters.

With respect to the fact that the OSL signal derived from single aliquots is always an averaged signal consisting of the individual luminescence signals from individual grains, it is suggested to reduce the size of the aliquots for the dating of sediments probably affected by incomplete bleaching (Duller, 2008). As only a small proportion of grains is emitting a luminescence signal at all, the reduction of the number of grains per aliquot has the effect that the measured OSL signal is composed of fewer individual signals emitted from individual grains. However, by comparing results from medium and small aliquots for incompletely bleached samples, Lüthgens et al. (2009b) have shown that the reduction of aliquot size does not necessarily result in a reduction of equivalent dose for all samples.

In order to further evaluate the effects of the luminescence characteristics of individual grains on the averaged signal of multiple grain aliquots and in order to obtain reliable and precise ages from ice proximal sandur sediments, 4mm (medium) aliquots, 2mm (small) aliquots and single grains of quartz have been measured using Optically Stimulated Luminescence (OSL) dating techniques based on the single aliquot regenerative dose protocol (SAR). First results from these comparative studies will be presented at the meeting.

References:

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