



Luminescence dating of Middle Pleistocene proglacial deposits from northern Switzerland: methodological aspects and stratigraphical conclusions

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Optically stimulated luminescence (OSL) dating was applied to proglacial deposits from the Klettgau Valley in northern Switzerland. This area is understood to record several phases of glaciation prior to the Last Interglacial and the aim was to provide an independent chronology for the different sedimentary units to better understand the complex depositional history of the region. This time range requires careful assessment of the reliability of the luminescence protocols applied and the resulting ages. Equivalent doses for fine and coarse grain quartz remained below 300 Gy, while dose response curves for both fractions continued to display growth above 500 Gy. Dose recovery tests confirmed the ability of the single aliquot regenerative (SAR) protocol to recover laboratory doses of a similar size to burial doses, and isothermal decay measurements confirmed the stability of the quartz signal. Having passed rigorous testing criteria, quartz OSL ages of up to ~ 200 ka were considered reliable but significantly underestimated expected ages and prompt a reconsideration of earlier interpretations of the stratigraphy for this site. Rather than representing three separate glaciations, quartz luminescence ages instead suggest that these deposits record up to four independent ice advances during Marine Isotope Stage 6. For both single grain and single aliquot feldspar dating, it was not possible to separate the conflicting influences of anomalous fading and partial bleaching. However, uncorrected feldspar Central Age Model ages were found to be in reasonable agreement with quartz age estimates, and suggest that they may still offer useful additional information in this region