

Successful performance of luminescence dating on glacial sediments

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The use of luminescence dating to establish accurate chronology of sedimentary environments has been exponentially increasing in the last decades. The age range covered and the versatility of the technique have made it become a key in studies of the Quaternary. Nevertheless luminescence dating of glacial sediments has shown to be challenging because of being affected by incomplete bleaching but also due to the complex luminescence behaviour of quartz grain within these sediments. This complexity often causes standard protocols in luminescence dating to be inadequate for this type of material.

More than 150 samples from glacial environments are being dated using OSL (optically stimulated luminescence) to provide a base for the BRITICE-CHRONO project which aim is to establish the retreat patterns of the last British and Irish Ice Sheet. This work presents the successful performance of luminescence dating on a selection of these samples for which ages coherent with the LGM have been estimated when applying improved measuring and analysing methods. Comparison with the results obtained using standard protocols showed that implausible ages would have been derived otherwise. In addition, within the B-C project duplicate samples of some sedimentary units have been measured. The coherent results obtained show the reproducibility of these improved methods giving robustness to the age estimates and providing a solid base for the establishing of the ice retreat patterns.