Late quaternary OSL chronologies from the Qinghai Lake (NE Tibetan Plateau): Intercomparison of quartz and K-feldspar ages to assess the pre-depositional bleaching

Signal resetting prior to deposition is an important factor for the accuracy of luminescence dating. In this study, resetting of the quartz optically stimulated luminescence (OSL) signal from samples collected from different depositional environments (alluvial, beach, and aeolian sediments) around the Qinghai Lake basin (northeastern Tibetan Plateau) was examined using its inter-comparison with post-IR infrared stimulated luminescence (IRSL) measured at 290 °C (pIRIR290) from K-feldspar. Dose recovery tests were carried out to test the success of the single aliquot regenerative-dose (SAR) protocol for quartz and feldspar. Additionally, stability tests (first IR temperature plateau and g-values) were performed for the pIRIR290. We observe that most of the K-feldspar pIRIR290 and quartz OSL ages are consistent with each other (within 10%), suggesting that the quartz OSL signal was well-bleached prior to the deposition. The ages of loess samples range between ∼13.1 and ∼1.5 ka, the alluvial sediments between ∼35 ka and ∼14 ka, and beach sediments between 60 and 50 ka, corresponding to early Marine Isotope Stage (MIS) 3. These quartz OSL chronologies suggest a lake highstand during very early MIS 3, a lowstand during late MIS 3 and MIS 2, and widespread loess accumulation through the Holocene in the Qinghai Lake basin.

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