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Optical dating of Holocene tidal deposits from the southwestern coast of the South Yellow Sea using different grain-size quartz fractions

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Abstract: The tidal flat deposit provides ideal sedimentary records for paleoenvironmental studies. Reliable chronology is crucial to utilize this archive for deciphering the history of environmental changes. In this study, we applied optically stimulated luminescence (OSL) dating method to a Holocene tidal flat sequence using both coarse-grained (CG, 90-200 μm) and fine-grained (FG, 4-11 μm) quartz extracts from a sedimentary core (YZ07) in western coast of the South Yellow Sea. The luminescence characteristics of the two grain-size fractions were investigated and then their resulting OSL ages were systematically compared. The results suggested that most tidal flat deposits are well bleached and their FG quartz ages are consistent with CG quartz ages, while some samples have CG ages underestimated compared with FG, likely resulted from the K-feldspar contamination for CG quartz. Hence, we applied post-IR OSL dating and pulsed OSL dating techniques; they could overcome the problems caused by feldspar contamination, and yielded identical dates as FG OSL ages.

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