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Late Holocene Varve Chronology and High-Resolution Records of Precipitation in the Central Tibetan Plateau

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Precise age controls are fundamental prerequisites for reconstructing past climate and environment changes. Lakes on the Tibetan Plateau are one of the important archives for studying past climate and environment changes. However, radiocarbon ages for lake sediment core are subject to old radiocarbon reservoir effects, which caused severe problems in constructing age controls for lake sediment cores, especially on the Tibetan Plateau (TP). Here we present a varve chronology over the past 2000 years at Jiang Co on the central TP. The clastic-biogenic varves comprise of a coarse-grained layer and a fine-grained layer observed by petrographic microscope and Electron Probe Micro Analyzer. Varve chronology is supported by measurements of ²¹⁰Pb and ¹³⁷Cs, which is further used to determine the radiocarbon reservoir ages in the past ~2000 years. The percentage of coarse-grain layer thickness within single varves was considered as proxy for precipitation as the coarse grains were mainly transported by runoff, which is highly correlated with local meteorological observation. During the past 2000 years, the precipitation records show centennial-scale fluctuations that are consistent with regional records. The varve chronology at Jiang Co provides a valuable opportunity to examine variation in reservoir ages on the TP and a robust chronology for reconstructing paleoclimate.