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Synchronizing the time-scales of the varved Lakes Czechowskie/Tiefer See sediment records to IntCal13 using the common cosmogenic radionuclide variations

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Paleoclimate archives provide unique insights into the dynamics of the climate system. However, time-scale uncertainties often inhibit the reliable investigation of leads and lags as well as time-transgressive climate variations. Identification and synchronization of common cosmogenic radionuclide variations in natural archives can lead to improved chronologies. This approach has been successfully applied to synchronize ^{10}Be records from Greenland ice cores and ^{14}C time-series from trees.

Here, we explore the potential of this approach for the synchronization of the ^{10}Be records from varved sediments of Lakes Czechowskie and Tiefer See to ^{14}C variations inferred from the IntCal13 calibration record around the grand solar minima at 250 BP (Maunder Minimum), 2800 BP (Homeric Minimum) and 5500 BP. We discuss the robustness of the synchronization. Furthermore, we investigate lake/catchment characteristics that favor the application of this method for comparing and synchronizing cosmogenic radionuclide records from varved lake sediments to those from other environmental archives.