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High-resolution analysis of 16 kyr old laminated sediments from Lake Nakuru, Kenya

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Two parallel 17-m-long sediment cores from Lake Nakuru, Kenya (0 deg 22 S, 36 deg 05 E, 1759 m asl) contain laminated sediments in a depth of 3.7 to 4.5 m. Three AMS 14C ages suggest an age of 16 kyr cal BP for the laminated part of the cores, that corresponds to the first wetting/warming phase in tropical Africa at ca. 17-16 kyr BP described by Gasse (2000). To prove or disprove the hypothesis that the laminae are annual layers (varves), we employed a number of analytical methods on a submillimeter scale, such as μ-XRD, μ-ED-XRF, EDX, the analysis of sediment characteristics and diatom assemblages in thin sections. Time-series analyses were then used to detect regularities in the laminated sediments. These regularities were compared with the temporal distribution of rainfall today, mainly influenced by the seasonal migration of the ITCZ, the NH summer monsoon and the El Nino/Southern Oscillation. Our results help to understand past changes in the relative influence of these componentes of the tropical climate system during the 20 kyrs.