



Atmospheric production signal in ^{10}Be from varved sediments of Lake Meerfelder Maar during the late glacial-early Holocene transition

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Beryllium 10 concentrations ($^{10}\text{Be}_{con}$) were measured at 20-year resolution in annually laminated (varved) sediments of Lake Meerfelder Maar (western Germany) covering the late glacial-early Holocene transition 11310-13130 varve years before present. Comparing the $^{10}\text{Be}_{con}$ record to environmental proxy records from the same archive indicates that varying sediment accumulation and composition only slightly modify trends, but do not substantially influence multi-decadal to centennial $^{10}\text{Be}_{con}$ excursions. Corrected for potential environmental biases using multiple-regression analysis, the resulting $^{10}\text{Be}_{atmosphere}$ time-series likely represents an alternative mid-latitude ^{10}Be production record, exhibiting broad similarities but also some differences to radionuclide records as ^{14}C in tree rings and ^{10}Be in polar ice cores. The preservation of the globally common atmospheric production signal in ^{10}Be from varved lake sediments indicates the, to date, largely unexplored potential of these archives for the synchronization to other radionuclide records around the globe, complementing existing solar activity reconstructions and Sun-climate studies.