

# **Response of Climate to Solar Forcing Recorded in a 6000-Year $\delta^{18}\text{O}$ Time Series of Chinese Peat Cellulose**

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Peat is one of the few terrestrial archives which may contain detailed information on natural variability of the Earth's climate. Previous studies have shown that the oxygen isotope ratio of plant cellulose can serve as a sensitive proxy indicator of past climate, but its application has mainly been restricted to tree-rings. Here we present a 6000 years high resolution  $\delta^{18}\text{O}$  record of peat plant cellulose from northeastern China. The  $\delta^{18}\text{O}$  variation is interpreted as reflecting changes in regional surface air temperature. The climate events inferred from the isotope data agree well with archaeological and historic evidence. The record shows a striking correspondence of climate events to nearly all of the apparent solar activity changes characterized by the atmospheric radiocarbon in tree-rings over the past 6000 years. Spectral analysis of the  $\delta^{18}\text{O}$  record reveals the periodicities of around 86, 93, 101, 110, 127, 132, 140, 155, 207, 245, 311, 590, 820 and 1046 years, which are similar to those detected in the solar excursions. We consider these observations as further evidence for a close relationship between solar activity and climate variations on time-scales of decades to centuries.