



Millennial Scale Variability of Atmospheric Dust Loading over the Holocene

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Millennial scale climate variations of the Northern hemisphere are provided by several paleoclimate proxy records: The Greenland ice core data have revealed a continuous 1470 years cycle over the last glacial. The continuation of this 1470 years cycle throughout the Holocene has been clearly shown by periodic abundance changes of ice rafted debris and foraminiferal assemblages in North Atlantic sediments cores. Longer scale variability with a period length of approx. 3 kys has become evident from variations of non-sea salt soluble constituents of the Greenland ice cores.

In this paper, variations in atmospheric dust loading over the Holocene and Termination I are examined. Variations in Potassium concentration of Greenland ice cores and for lake Baikal magnetic susceptibility are analyzed in terms of wavelet analysis. This analysis reveals that these variations are dominated by periodic components with a period lengths of 1500 and 3000 years. The 3000 years cyclicity can be related to an expanding and contracting polar vortex, the 1500 years cycle is the tact of ice discharge into the North Atlantic which is expected to be the damped continuation of the series of Dansgaard-Oeschger events. Wavelet phase analysis provides evidence for phase coherence of the two identified cycles between both locations. This accounts for the Northern hemispheric character of these cyclicities.