



Interannual to decadal variability in a central Greenland deuterium high-resolution record and its relation with atmospheric teleconnection and daily circulation patterns

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The relationship between the variability of an annual-resolution deuterium record from central Greenland ice core and the atmospheric circulation variability is analysed using long time series of the atmospheric teleconnection pattern indices as well as long time series of the frequency of daily atmospheric circulation patterns. The signal of atmospheric teleconnection patterns in deuterium record is relatively weak both at interannual and decadal time scales. Only the North Atlantic Oscillation and Scandinavian pattern indices are significantly correlated with deuterium time series but the correlation is relatively low. Contrary, the deuterium time series is highly correlated with the frequency of several daily circulation patterns both at interannual and decadal time scales. Furthermore, deuterium record shows a strong periodicity at a time scale of about 20 years. We identified a similar cycle in a winter daily circulation pattern that influences the deuterium variability via modulation of warm air advection toward central Greenland. We argue that deuterium and other high-resolution records from Greenland ice cores are better proxies for the frequency of certain daily circulation patterns than the for the atmospheric teleconnection indices both at interannual and decadal time scales.