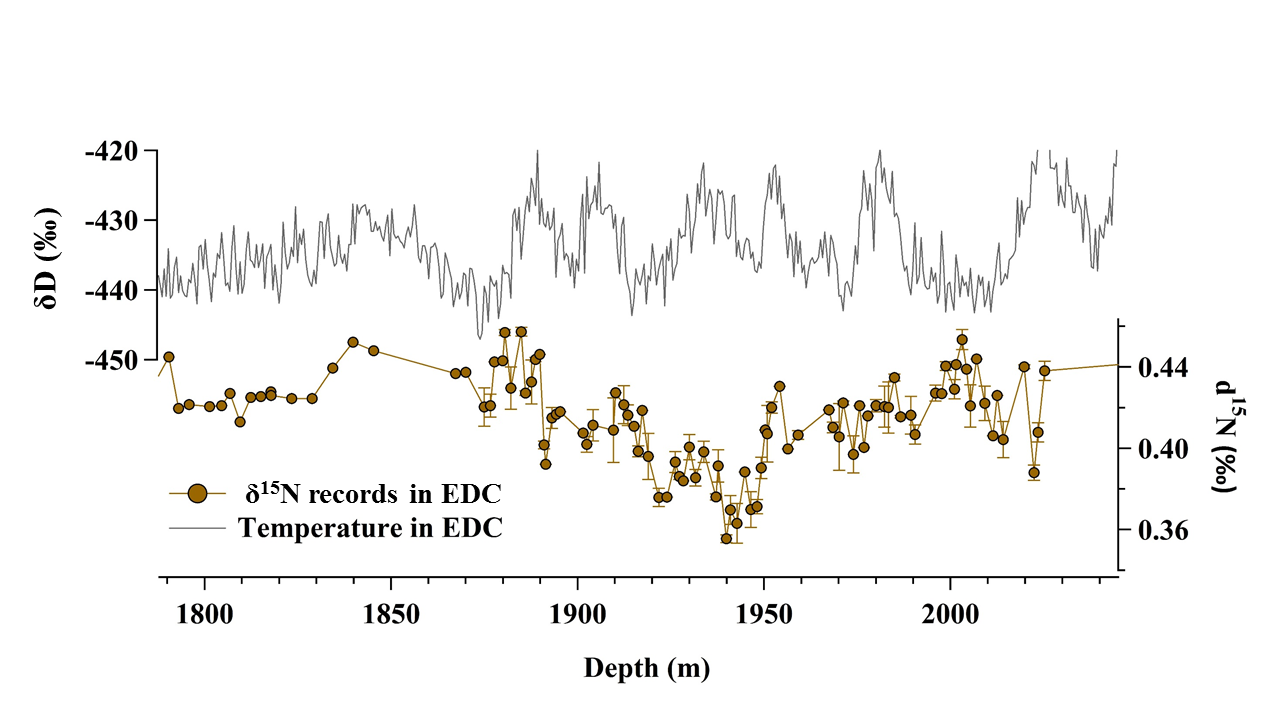


Figure 1: Atmospheric CH4 concentrations from EDC ice core during MIS 6. Both dark green squares (Loulergue et al., 2008) and light green dots (this study) were measured at IGE.



**Figure 2:** δD and δ15N from EDC ice core plotted as a function of depth. For δ15N, 88 new data points are added to the previous measurements (Landais et al., 2013). The error bar indicates the standard deviation of replicate.

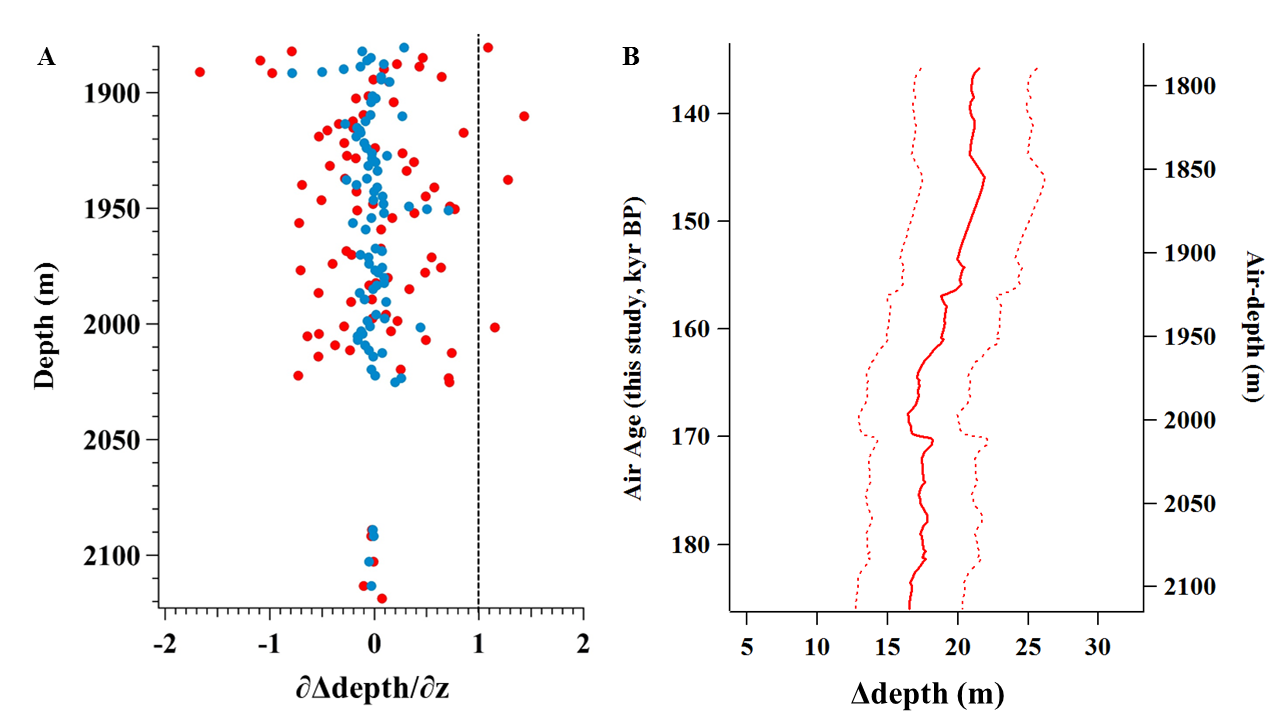


Figure 3: A: ∂Δdepth/∂z as a function of depth. Red dots from the raw δ15N measurements. Blue dots from a 3-point running mean weighted by 500/dT. Vertical dashed line indicates when ∂Δdepth/∂z function is 1. B: ∆depth (bold line) for EDC from 1787.5 to 1870.2 m below the surface, deduced from δ15N and the thinning function calculated in this depth range. The two dash lines corresponds to the analytical uncertainties.

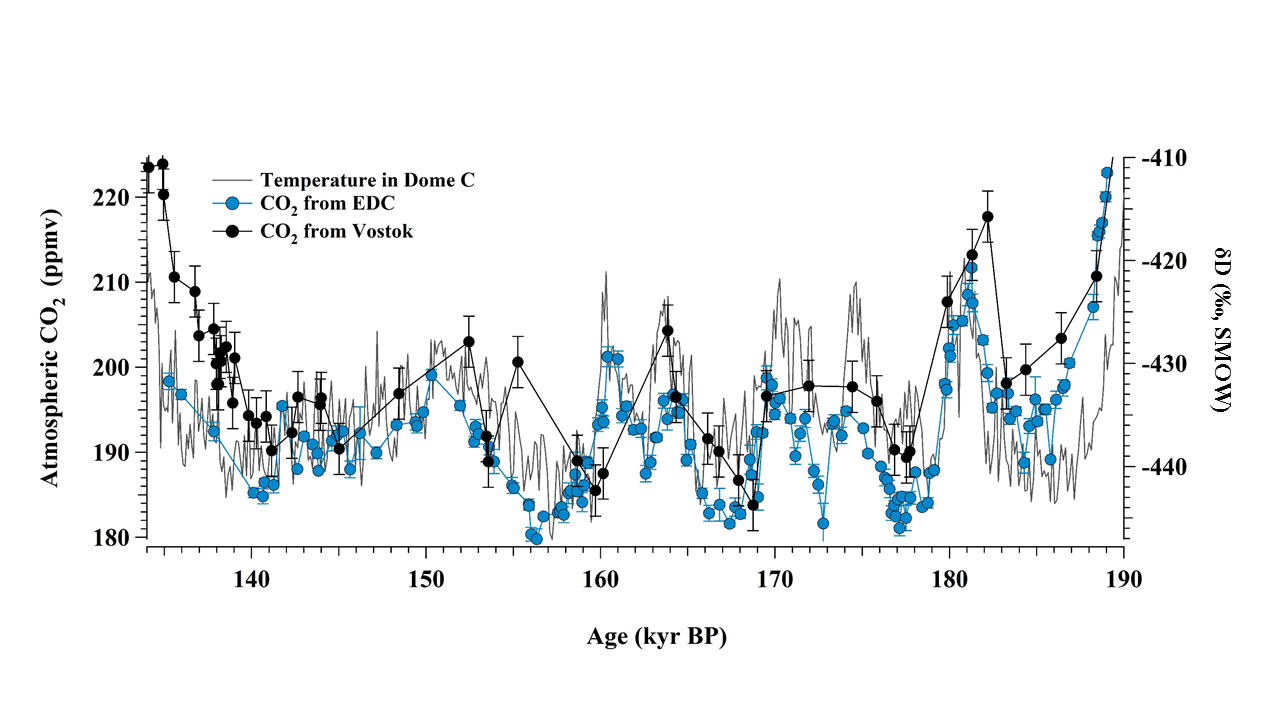


Figure 4: Atmospheric CO2 from EDC (blue, this work) and Vostok (black, Petit et al., 1999) ice cores, compared to the δD of water at EDC (temperature proxy) (Jouzel et al., 2007) from 190─135 kyr BP.

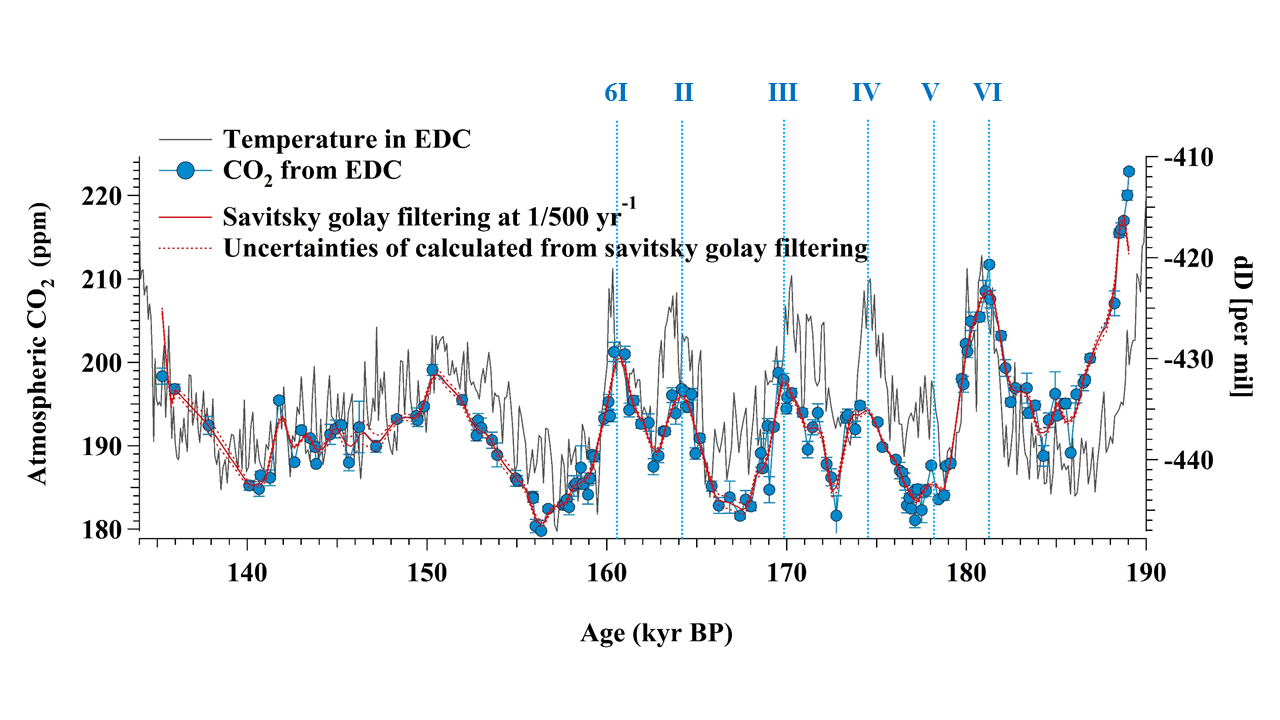


Figure 5: Atmospheric CO2 from EDC (this study) and EDC water isotopic record (Jouzel et al., 2007). Red line indicates Savitsky Golay filtering curve made with a 500 yr cut-off period (red dotted line) Vertical dotted lines indicate the six CDM events that we identify during the early MIS 6.

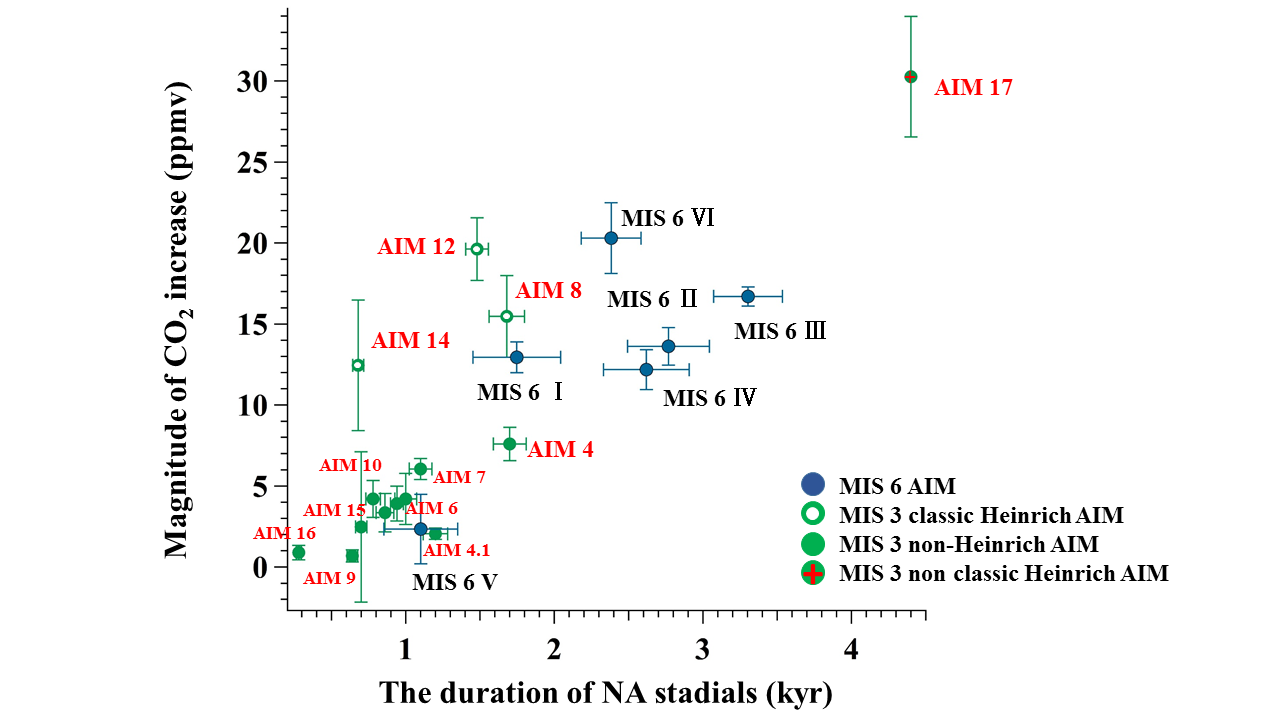


Figure 6: The relationship between North Atlantic Stadial duration and magnitude of CO2 increase during the early MIS 6 period. Green dots indicate non-Heinrich AIM events during MIS 3, green dots with a white dot in the middle indicate classic Heinrich AIM events during MIS 3, and green dots with a red cross in the middle indicate non classic Heinrich AIM events during MIS 3 period. Blue dots indicate AIM events during MIS 6 respectively.

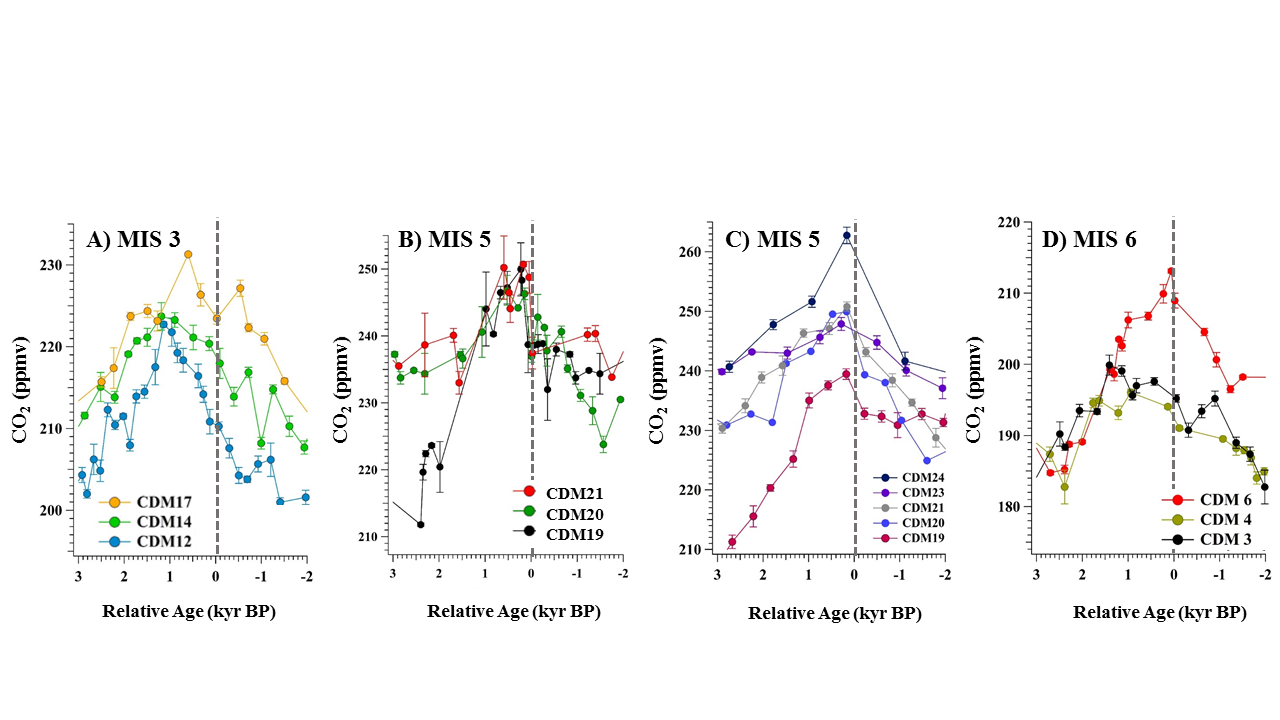


Figure 7: CDM lags relative to abrupt temperature increase in Northern Hemisphere. Grey dotted line indicates when climate changes abruptly in Northern Hemisphere. A: Atmospheric CO2 was recorded from TALDICE (MIS 3), B: Atmospheric CO2 was recorded from Byrd (MIS 5), C: Atmospheric CO2 was recorded from EDML (MIS 5), D: Atmospheric CO2 was recorded from EDC (MIS 6).

Figure 8: Proxy data during 250 kyr BP. A: δ18Ocalcite from Sanbao cave, corresponding with the strength of the East Asian monsoon (Cheng et al., 2016). B: 21 June insolation for 65°N (Berger, 1978). C: Dust flux in EDC (Lambert et al., 2012). D: Atmospheric CH4 in EDC (green dots) (Loulergue et al., 2008) and Atmospheric CH4 in EDC in this study (light yellow dots). E: Atmospheric CO2 from EDC in this study (light blue dots) and composite CO2 from Antarctic ice cores (dark blue dots) (Bereiter et al., 2015). F: δD composition in EDC, Antarctica (Jouzel et al., 2007).

