

Supplementary Online Materiel (SOM) corresponding to: Sub-millennial climate variability from high resolution water isotopes in the EDC ice core

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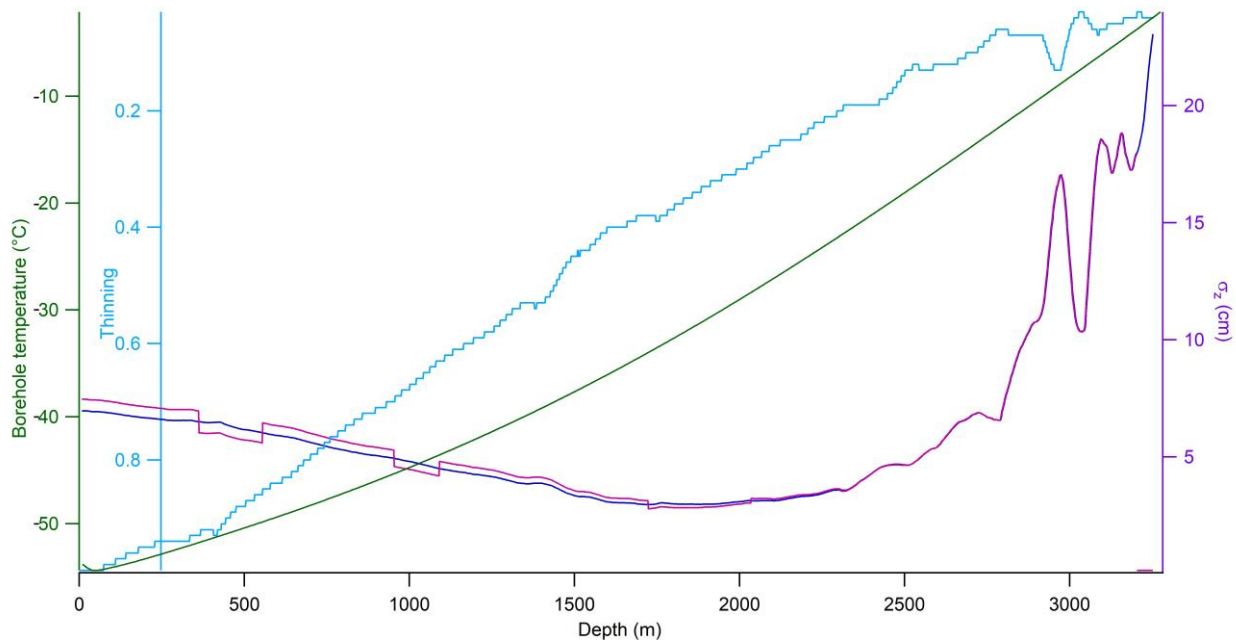


Figure S1: Evolution of the diffusion length σ_z calculated from Ramseier (1697) ice diffusion and two values of σ_{firn} : a constant firn diffusion length σ_{firn} (7 cm, blue) and a variable σ_{firn} (7.5 cm during interglacial periods and 6.5 cm during glacial periods, violet). The evolution of thinning from AICC2012 chronology (Bazin et al., 2013; light blue) and borehole temperature (green) (Buizert et al. 2021) over the EDC ice core are also shown on a depth scale over the EDC ice core.

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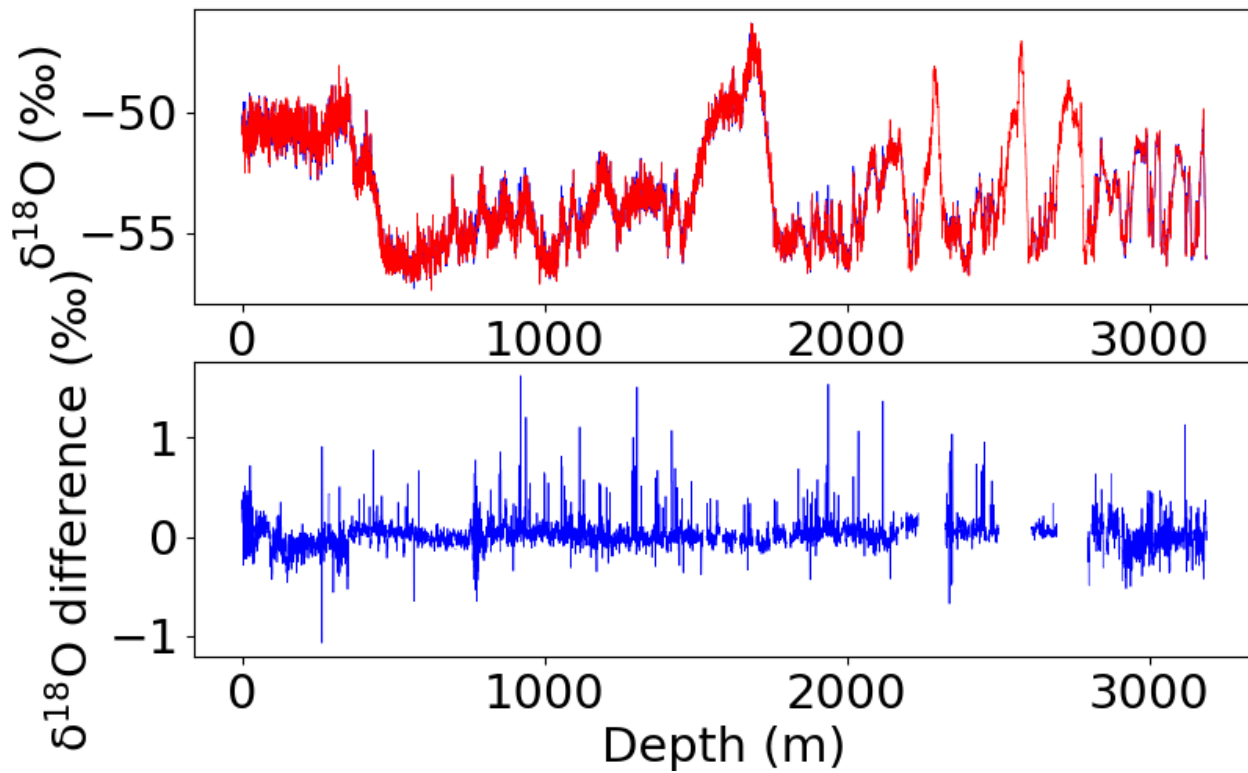
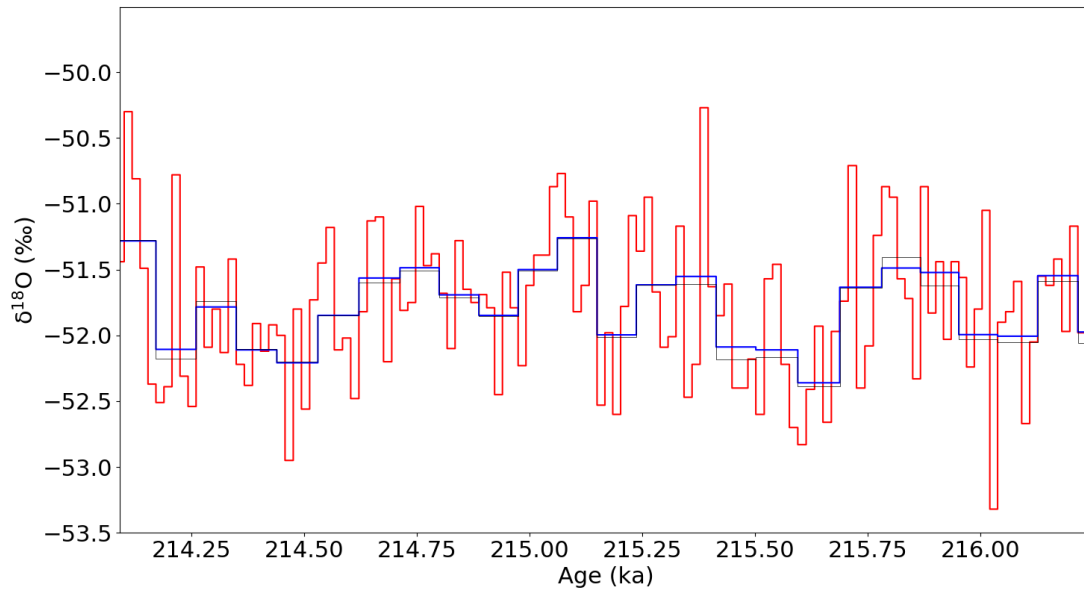
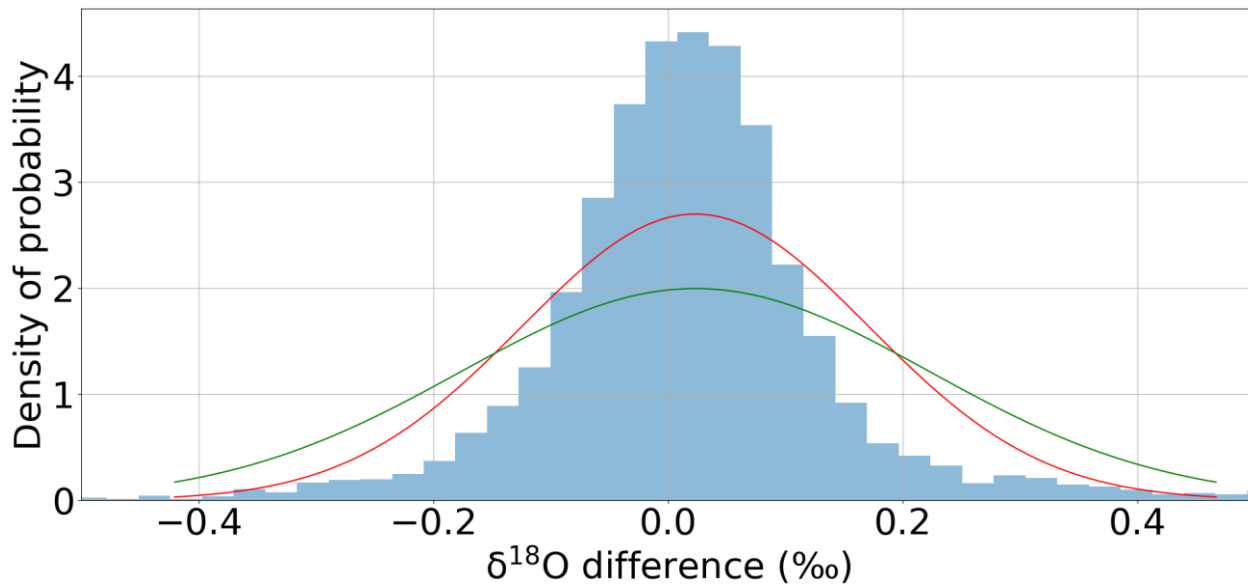


Figure S2: (first panel) Evolution with depth of low (55 cm) resolution $\delta^{18}\text{O}$ measurements over the EDC ice core performed between 2002 and 2007 by the $\text{H}_2\text{O}-\text{CO}_2$ equilibration method (Landais et al., 2021) (blue) and the average over each 55 cm bag of $\delta^{18}\text{O}$ measured on 11 cm resolution samples (red, see also Figure S3). (bottom panel) Difference between the $\delta^{18}\text{O}$ values in low resolution and the average of 11 cm resolution samples over each 55 cm bag.

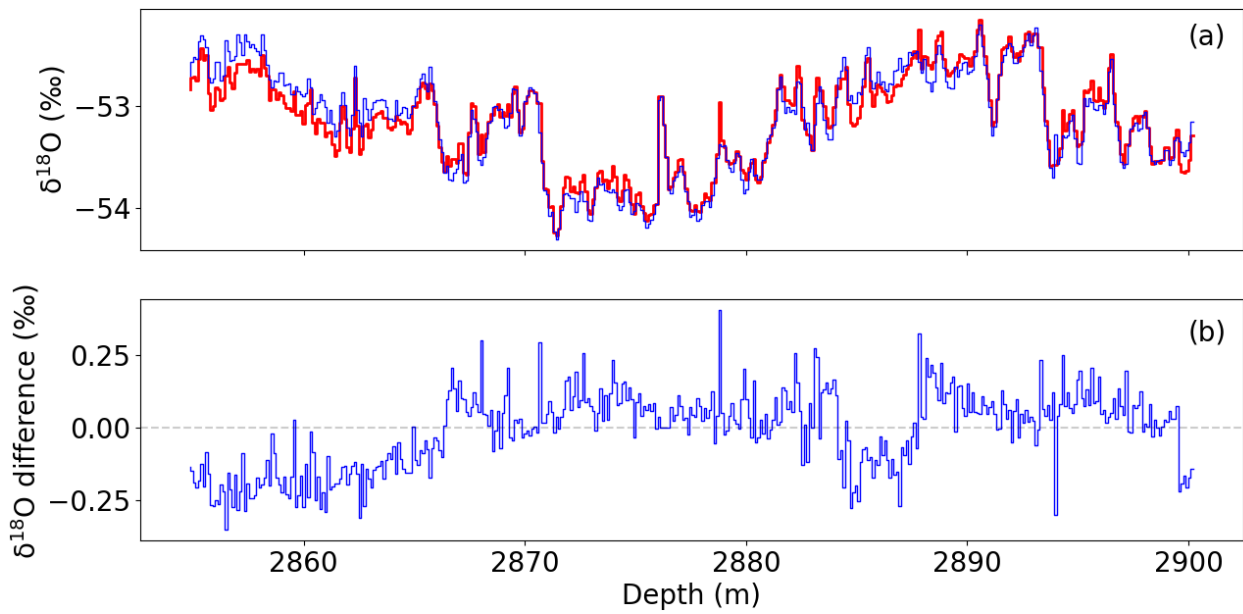
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30 **Figure S3: Details of the $\delta^{18}\text{O}$ comparison between low resolution (55 cm, blue), high resolution (11 cm, red) and average of 11 cm resolution samples over each 55 cm bag (grey).**



35 **Figure S4:** Density of probability for the difference between the low resolution $\delta^{18}\text{O}$ measurements and the average of $\delta^{18}\text{O}$ measurements of 11 cm resolution samples over each 55 cm bag displayed on figure S2. A gaussian curve (red) is fitted to the data. A gaussian curve (green) is displayed with a standard deviation equal to the 1σ uncertainty of $\delta^{18}\text{O}$ (0.2‰).



40 **Figure S5 : (a) Evolution with depth of $\delta^{18}\text{O}$ measurements over Termination 6 performed by the University of Copenhagen (blue) and $\delta^{18}\text{O}$ measurements performed in 2019 by CRDS at LSCE (red). (b) Difference between the $\delta^{18}\text{O}$ values measured before 2010 and in 2019. A statistical test was made on the correlation between the absolute value of $\delta^{18}\text{O}$ and the $\delta^{18}\text{O}$ difference between the two series of measurements leading to a Pearson coefficient of -0.1477 and a p-value of 0.0025.**

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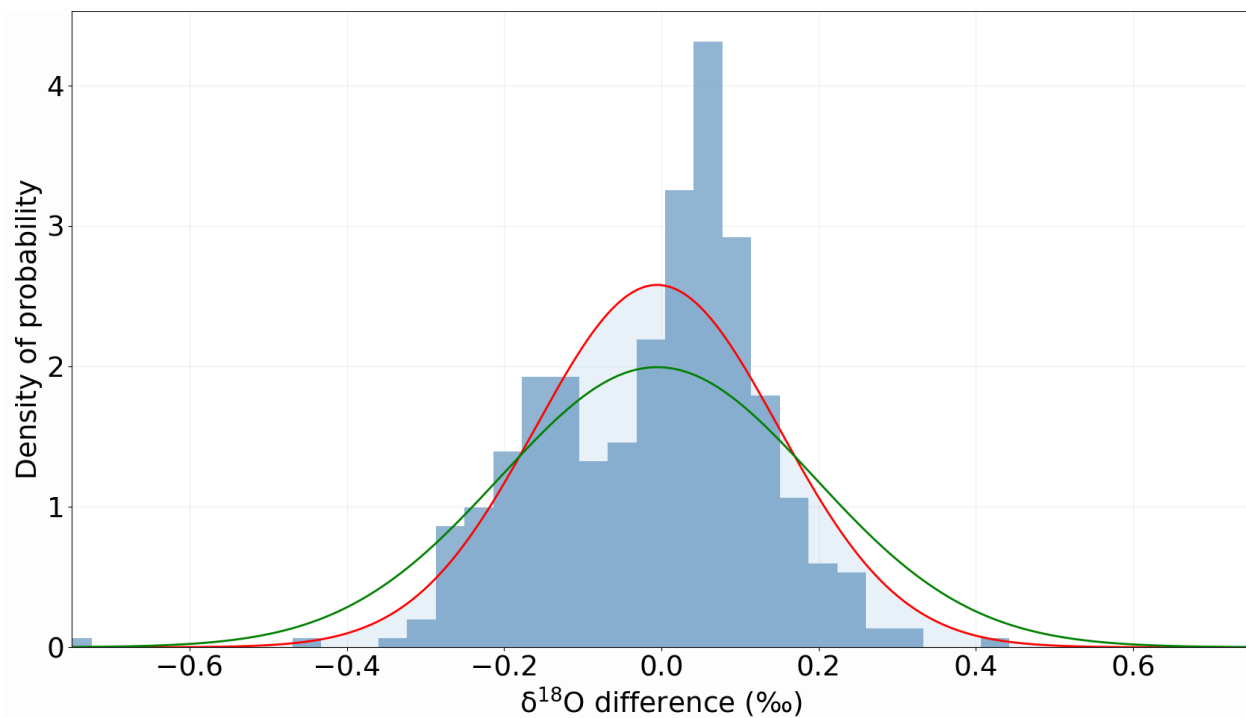


Figure S6 : Probability Density Function for the difference between the old (University of Copenhagen) and the new (LSCE) $\delta^{18}\text{O}$ measurements. A gaussian curve (red) is fitted to the data. A gaussian curve (green) is displayed with the standard deviation equal to the classically displayed 1σ uncertainty of $\delta^{18}\text{O}$ measurements by CRDS at LSCE ($1\sigma = 0.2\text{‰}$).