Supplement of The Cryosphere, 11, 1297–1309, 2017
http://www.the-cryosphere.net/11/1297/2017/
doi:10.5194/tc-11-1297-2017-supplement

The Cryosphere Open Access EGU

Supplement of

Calibrated cryo-cell UV-LA-ICPMS elemental concentrations from the NGRIP ice core reveal abrupt, sub-annual variability in dust across the GI-21.2 interstadial period

Damiano Della Lunga et al.

Correspondence to: Damiano Della Lunga (dellalungadamiano@gmail.com)

Supplementary material

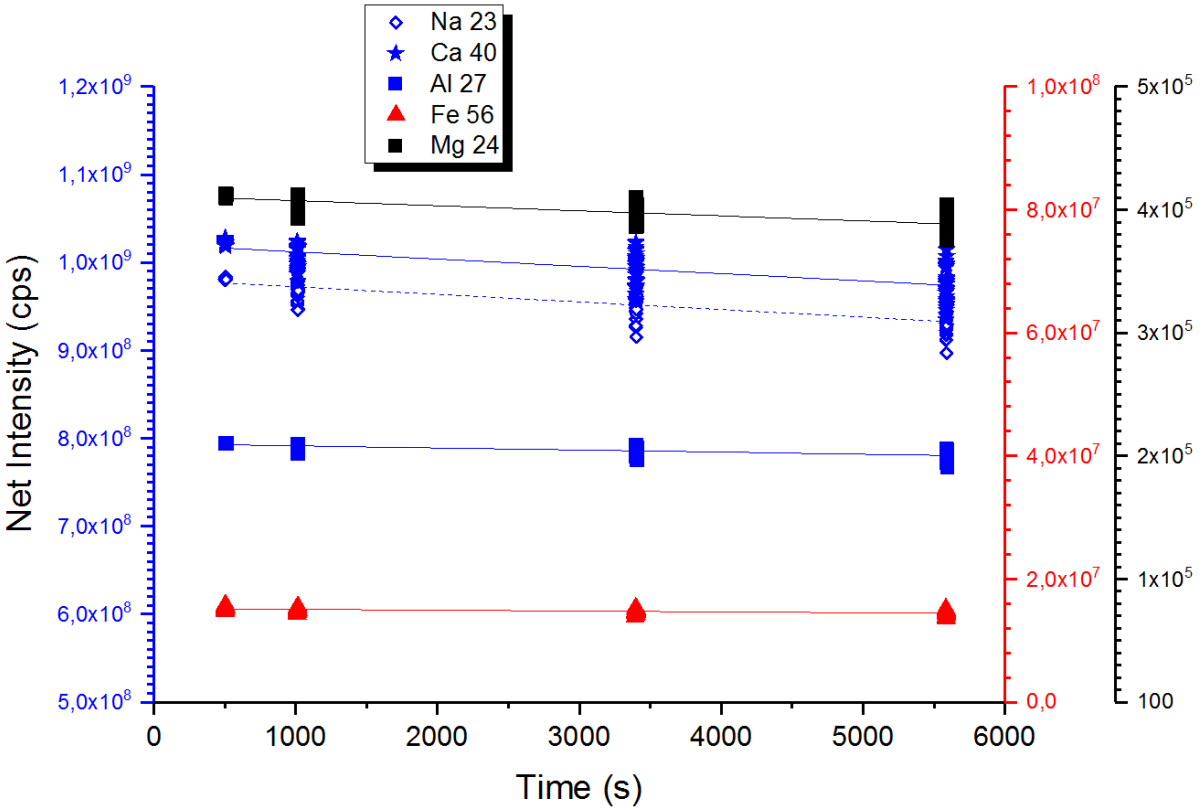

Figure S1: LA-ICPMS instrumental drift correction. The data points represent NIST612 values acquired in between the ice samples during a single run (axes are color-coded). Sensitivity typically decreases slightly during the analysis and the slope of each element's regression line has been utilized to correct instrumental drift according to eq.1 (See text for details).

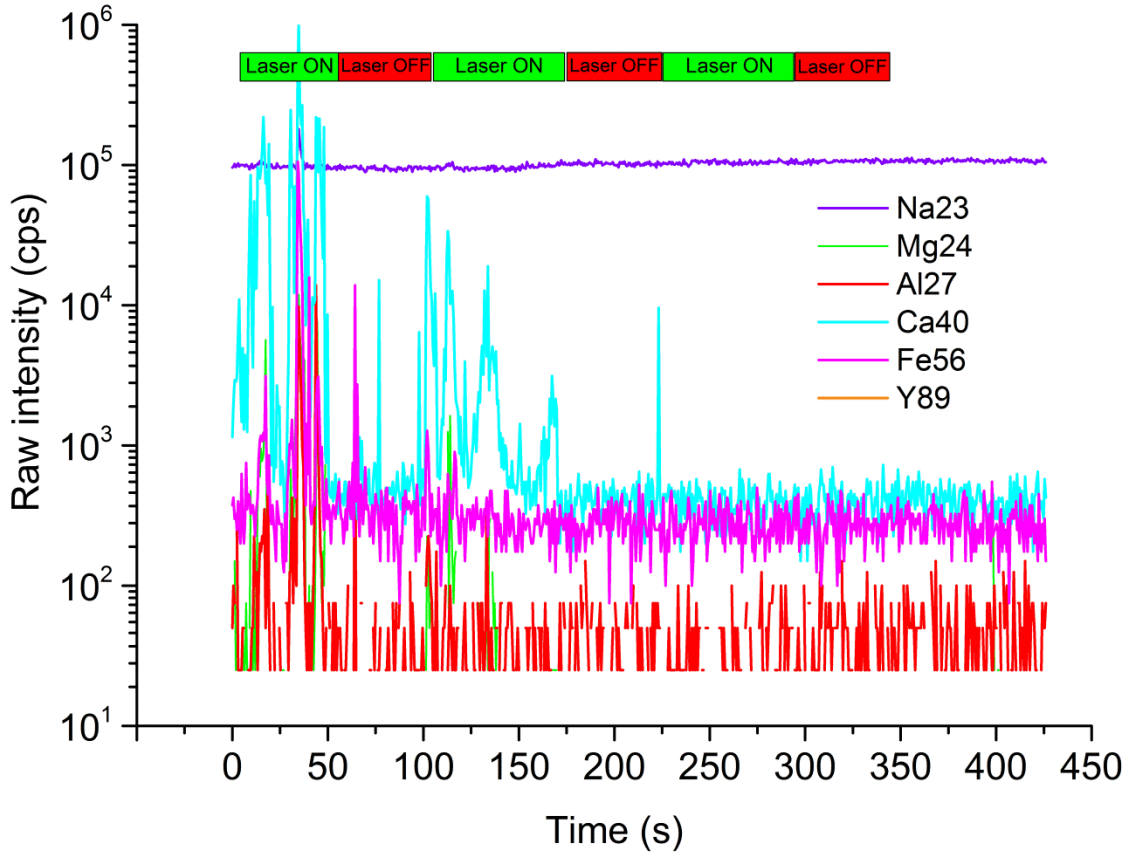

Figure S2: UV-LA-ICPMS analysis of an ice blank. The analysis includes three passages of the laser with 280 µm spot size, 25 Hz repetition rate and 8 mm/min speed, while the last acquisition track has been performed with 212 µm spot size, 20 Hz repetition rate and 3 mm/min speed where no analytes are above ICPMS background anymore. Analytes are the most abundant isotopes for each element. Table 1 lists the calibrated concentration (in ppb) of the major elements under investigation in the ultrapure water utilized to create ice blanks. See text for details.

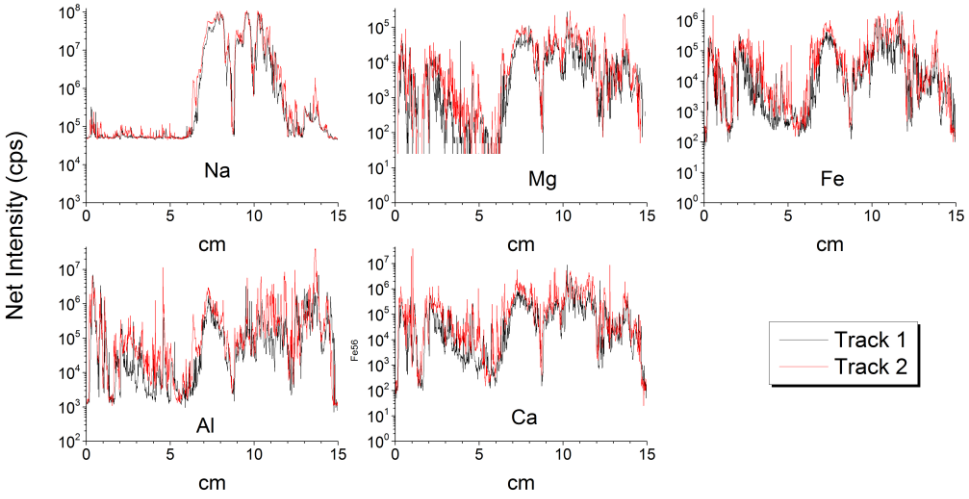

Figure S3: Reproducibility of LA tracks: example of drift-corrected intensities (cps) of the main isotopes from two parallel ablation tracks that are 2 mm apart and which were acquired across three contiguous ice core sections over 150 mm between NGRIP depths of 2691.45-2691.30 m (left to right).

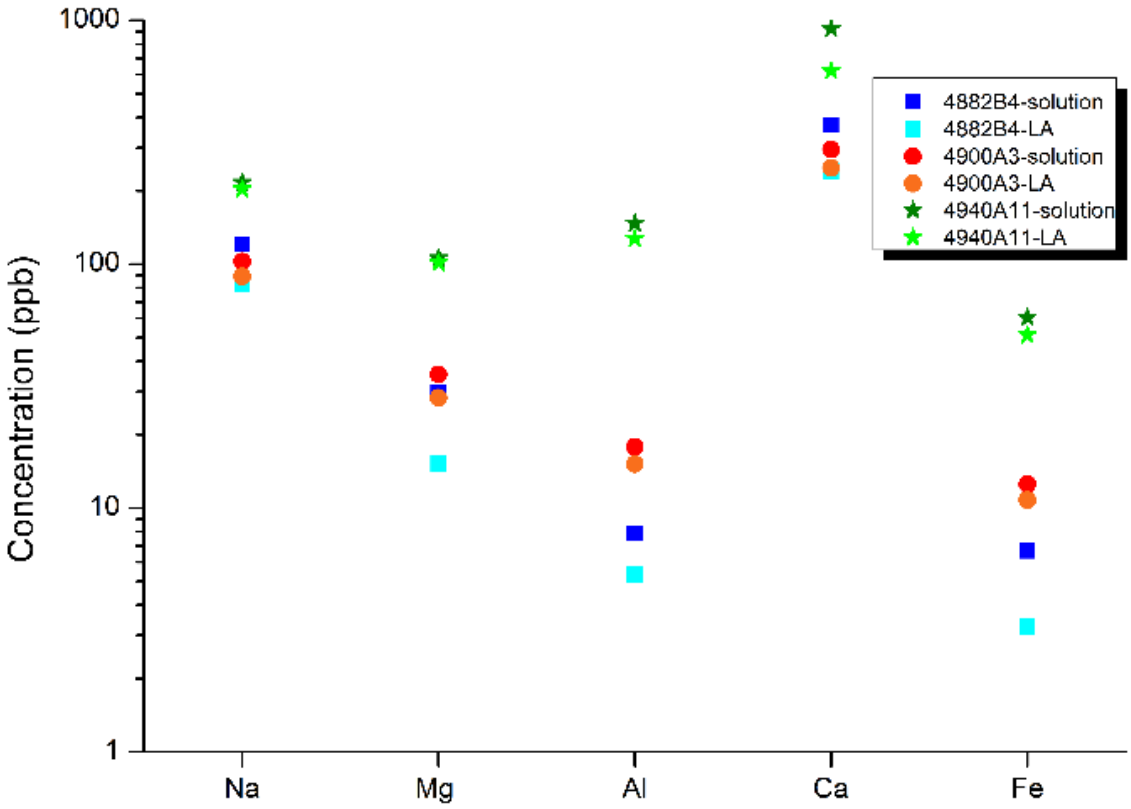

Figure S4: Comparison between solution data and cryo-cell UV-LA-ICPMS data of three different samples corresponding to three different 50-mm depth intervals: 4940A11 (depth range: 2716.45 – 2716.50 m), 4900A3 (depth range: 2694.85 – 2694.90 m) and 4882B4 (depth range: 2684.875 – 2684.925 m), representing small sections of early GS-22, late GS-22 and GI-21.1, respectively. Results show that LA and solution data differ of only 5 – 20% and therefore are within error margins. See text for details.

Table S1: Concentrations of elements under investigation in aqueous reference materials used for ice standard preparation: SLRS-5-"River water reference material for trace metals" (National Research Council of Canada, diluted 10 times [SLRS-5_10] when not specified), Water low (RHUL internal standard), 90243 Multi-element standard solution 1 for ICP (Sigma Aldrich, diluted 20 times), and NIST SRM 1648 Urban Particulate reference material (in suspension, see text for details). Blank concentrations (in ppb) of ultrapure water at RHUL were obtained in solution mode and are shown on the right column. Limit of detection (LOD) refers to cryo-cell LA-ICPMS analyses only.

	Standard name					
	SLRS-5_10	ICP-20	Water Low	NIST1648a		RHUL Deionized water
Element	**concentration (ppb)**	**concentration (ppb)**	**concentration (ppb)**	**concentration (ppb)**	**LODs LA-ICPMS (ppb)**	**(ppb)**
Al	4.95 ± 0.5 49.5 ± 4.8 (SLRS-5)	2525±2.5	9.8±0.1	1683±16	1.12	0.012
Fe	9.1 ± 0.6 91 ±6 (SLRS-5)	505±0.5	9.8±0.1	1924±20	1.06	0.627
Ca	1050 ± 40 10510±380 (SLRS-5)	505±0.5	48.9±0.3	3126±15	0.63	0.606
Mg	254 ± 16 2541±155 (SLRS-5)	505±0.5	48.9±0.3	394±5	0.92	0.021
Na	538 ± 10 5380±105 (SLRS-5)	2525±2.5	244±1.5	209±4	48.3	-