1	Technical Note: Evaluation of between-sample memory effects in the
2	analysis of $\delta^2$ H and $\delta^{\!$
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## 20 Tables

21 Table 1. Isotopic compositions of samples and laboratory measurement standards. The reported values

ю	$\delta^2 H$	std. dev.	$\delta^{\!\!\!18}$ O	std. dev.
	(‰)	$\delta^2$ H (‰)	(‰)	δ <sup>18</sup> Ο (‰)
1	-231.7	0.5	-29.83	0.02
2	-258.7	0.4	-33.07	0.01
3	-277.5	0.5	-34.96	0.02
4	-303.8	0.4	-38.26	0.03
5	-312.2	0.6	-39.47	0.02
6	-334.7	0.4	-42.24	0.02
7	-338.5	0.5	-43.73	0.02
8	-373.1	0.4	-48.02	0.02
9	-390.4	0.5	-50.20	0.02
10	-421.1	0.5	-53.41	0.02
STD1	-221.8	0.5	-29.06	0.04
STD2	-313.8	0.4	-40.22	0.02
STD3	-422.8	0.4	-53.83	0.02

22 represent the average and the standard deviation of ten replicates.

Table 2. Sequence of samples and standards in the analysis run and absolute isotopic differences (IRMS values) between each vial and the previous. DW:

	DW	STD 1	STD 3	STD 2	5	4	3	2	1	STD 1	STD 3	STD 2	6	7	8	9	10	STD 1	STD 3	STD 2
$\delta^2$ H difference (‰)	-	166	201	109	2	8	26	19	27	10	201	109	21	4	35	17	31	199	201	109
$\delta^{\!$	-	21	25	14	1	1	3	2	3	1	25	14	2	1	4	2	3	24	25	14

25 deionized water. STD: laboratory measurement standard. Number: sample ID. All values are rounded to improve the readability.

27 Table 3a. Average and standard deviations of memory effects (hydrogen) considering the first ten and the last eight injections out of 18 for three

		First 1	0 out of	18 injed	tions	Last 8 out of 18 injections							
	LGR-1	LGR-2	LGR-3	PIC-1	PIC-2	PIC-3	LGR-1	LGR-2	LGR-3	PIC-1	PIC-2	PIC-3	
Number of samples	30	30	30	30	30	30	24	24	24	24	24	24	
Average (%)	1.9	3.0	1.1	1.4	1.3	1.5	0.3	0.2	0.1	0.2	0.2	0.1	
Std. deviation (%)	2.9	3.9	1.7	1.3	1.7	1.7	0.3	0.6	0.1	0.1	0.2	0.1	

28 transitions in an analysis run (considered together) between STD1 and STD3.

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- 31 Table 3b. Average and standard deviations of memory effects (oxygen) considering the first ten and the last eight injections out of 18 for three transitions
- 32 in an analysis run (considered together) between STD1 and STD3.

		First 1	0 out of	18 injed	tions	Last 8 out of 18 injections							
	LGR-1	LGR-2	LGR-3	PIC-1	PIC-2	PIC-3	LGR-1	LGR-2	LGR-3	PIC-1	PIC-2	PIC-3	
Number of samples	30	30	30	30	30	30	24	24	24	24	24	24	
Average (%)	1.4	2.4	0.8	1.0	1.0	1.1	0.3	0.2	0.2	0.1	0.2	0.1	
Std. deviation (%)	2.0	2.5	1.1	0.8	1.2	1.0	0.4	0.5	0.1	0.1	0.1	0.1	

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Figure 1a. Sample isotopic stabilization by sequential injection number for three laboratory
 measurement standards (second triplet in an analysis run) for hydrogen. Left column: OA-ICOS
 instruments. Right column: CRDS instruments.



Figure 1b. Measurement stabilization by sequential injection number for three laboratory measurement
standards (second triplet in an analysis run) for oxygen. Left column: OA-ICOS instruments. Right
column: CRDS instruments.



Figure 2. MEs as a function of the number of sequential injections of the same vial for the transition
between STD1 and STD3 (third triplet in an analysis run). Upper row: hydrogen. Lower row: oxygen. Left
column: OA-ICOS instruments. Right column: CRDS instruments.



Figure 3. Relation between the isotopic range (maximum-minimum) within each vial (either sample or measurement standard) and the absolute isotopic difference between adjacent vials in the tray. Upper row: hydrogen. Lower row: oxygen. Left column: OA-ICOS instruments. Right column: CRDS instruments.



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Figure 4a. Standard deviation for  $\delta^2$ H for two laboratory measurement standards and one sample as a function of number of averaged injections. 18/18 indicates that all 18 injections of the same vial (either standard or sample) were averaged, whereas 17/18, 16/18, 15/18... indicates that only the last 17, 16, 15... injections were averaged (and the remaining discarded). The dotted horizontal line indicates currently acceptable reference precision for  $\delta^2$ H (1 ‰). The legend depicts the difference between the isotopic composition of the standard/sample displayed and the isotopic composition of the previous vial analysed in the tray.



number of last averaged injections (out of 18)

Figure 4b. Standard deviation for  $\delta^{48}$ O for two laboratory measurement standards and one sample as a function of number of averaged injections. 18/18 indicates that all 18 injections of the same vial (either standard or sample) were averaged, whereas 17/18, 16/18, 15/18... indicates that only the last 17, 16, 15... injections were averaged (and the remaining discarded). The dotted horizontal line indicates an acceptable reference precision for  $\delta^{48}$ O (0.1 %). The legend depicts the difference between the isotopic composition of the standard/sample displayed and the isotopic composition of the previous vial analysed in the tray.