# Supplementary Tables:

| Name | $\delta$D (‰) | $\delta^{17}$O (‰) | $\delta^{18}$O (‰) | d-excess (‰) | $\Delta^{17}$O (per meg) |
|---|---|---|---|---|---|
| FL0 | 6.47 | - | 0.56 | 2 | - |
| BER | -2.10 ± 0.17 | -0.05 ± 0.02 | -0.25 ± 0.02 | 4 | 82 |
| SW | -75.63 ± 0.17 | -5.5515* | -10.55 ± 0.02 | 9 | 33 |
| FL1 | -81.1 | - | -11.65 | 12 | - |
| WW | -268.30 ± 0.31 | -17.9754* | -33.82 ± 0.03 | 2 | 27 |
| FL2 | -308.14 | - | -40.06 | 12 | - |
| SP | -435.31 | -29.6497 | -55.39 | 8 | -11 |
| AW | - | - | - | | 17 |

**Table S1: Standards used in this study. Precision (±) is the standard error. *$\delta^{17}$O values calculated from $\Delta^{17}$O and $\delta^{18}$O.**

| Name | SW (g) | WW (g) | Ratio | $\Delta^{17}$O (ppm) |
|---|---|---|---|---|
| M20 | 15.85 | 3.99 | 0.2011 | 21 ± 13 |
| M50 | 9.93 | 9.93 | 0.5000 | 12 ± 13 |
| M85 | 16.96 | 2.98 | 0.8506 | 18 ± 13 |

**Table S2: Samples used to perform $\Delta^{17}$O tests. M20 - M85 resulted from a mixture of SW and WW. Ratio is $WW_{mass}/(SW_{mass}+WW_{mass})$.**

| Name | Start (Oct. 2022) | Stop (Oct. 2022) | Holder # | Duration (hours) | $H_2O$ mean | $H_2O$ std | n |
|---|---|---|---|---|---|---|---|
| SP | 10 16:18 | 10 20:18 | 1 | 4 | 17353 | 118 | 13790 |
| BER-01 | 10 20:18 | 11 04:18 | 2 | 8 | 17296 | 215 | 27634 |
| BER-02 | 11 04:18 | 11 12:18 | 3 | 8 | 17163 | 410 | 27652 |
| BER-03 | 11 12:18 | 11 19:18 | 4 | 7 | 17143 | 571 | 24202 |
| BER-04 | 11 19:18 | 12 02:18 | 2 | 7 | 17067 | 310 | 24215 |
| BER-05 | 12 02:18 | 12 09:18 | 3 | 7 | 17177 | 120 | 24223 |
| BER-06 | 12 09:18 | 12 16:18 | 4 | 7 | 17186 | 560 | 24224 |
| BER-07 | 12 16:18 | 12 23:18 | 2 | 7 | 17265 | 168 | 24228 |
| BER-08 | 12 23:18 | 13 06:18 | 3 | 7 | 17232 | 349 | 24243 |
| BER-09 | 13 06:18 | 13 13:18 | 4 | 7 | 17239 | 318 | 24222 |
| BER-10 | 13 13:18 | 13 20:18 | 2 | 7 | 17242 | 146 | 24208 |
| BER-11 | 13 21:00 | 14 04:42 | 3 | 7 | 17256 | 353 | 26609 |
| BER-12 | 14 04:42 | 14 11:42 | 4 | 7 | 17380 | 113 | 24189 |
| BER-13 | 14 11:42 | 14 12:24 | 2 | <1 | 17460 | 204 | 2418 |

**Table S3: Sequence of standard injected for the long term stability test.**

For panels **(a)** and **(b)**

| Data | off | a | b | $R^2$ |
|---|---|---|---|---|
| **$\delta^{18}O$ FL0** | 0.0327 ± 0.0167 | -9.3335 ± 4.5600 | -0.0054 ± 0.0009 | 0.9782 |
| **$\delta^{18}O$ FL1** | 0.0292 ± 0.0316 | -1.8082 ± 0.454 | -0.0016 ± 0.0004 | 0.9718 |
| **$\delta^{18}O$ FL2** | -0.0141 ± 0.0610 | -4.4829 ± 0.6220 | -0.0019 ± 0.0003 | 0.9965 |
| | | | | |
| **$\delta D$ FL0** | 0.2708 ± 0.2230 | 15.4957± 2.5800 | -0.0020 ± 0.0003 | 0.9805 |
| **$\delta D$ FL1** | -0.1496 ± 0.0859 | 17.3759± 8.4800 | -0.0031 ± 0.0007 | 0.9587 |
| **$\delta D$ FL2** | 0.0391 ±0.0859 | -14.3201 ± 1.3100 | -0.0022 ± 0.0002 | 0.9953 |

For panels **(c)** and **(d)**

| Data | off | a | b | $R^2$ |
|---|---|---|---|---|
| **$\delta^{18}O$ SD** | 0.4171 ± 0.0179 | 3.7372 ± 0.2340 | -0.0019 ± 0.0001 | 0.9943 |
| **$\delta D$ SD** | 1.2720 ± 0.1060 | 13.8565 ± 0.9990 | -0.0017 ± 0.0001 | 0.9778 |

**Table S4: Results of the best fits are reported in Figure 6 of the manuscript. Coefficients reported with standard error. H2O is the mixing ratio in ppmv measured by the CRDS analyzer against the best fit equation: off+a*expb*H2O**

# Supplementary Figures

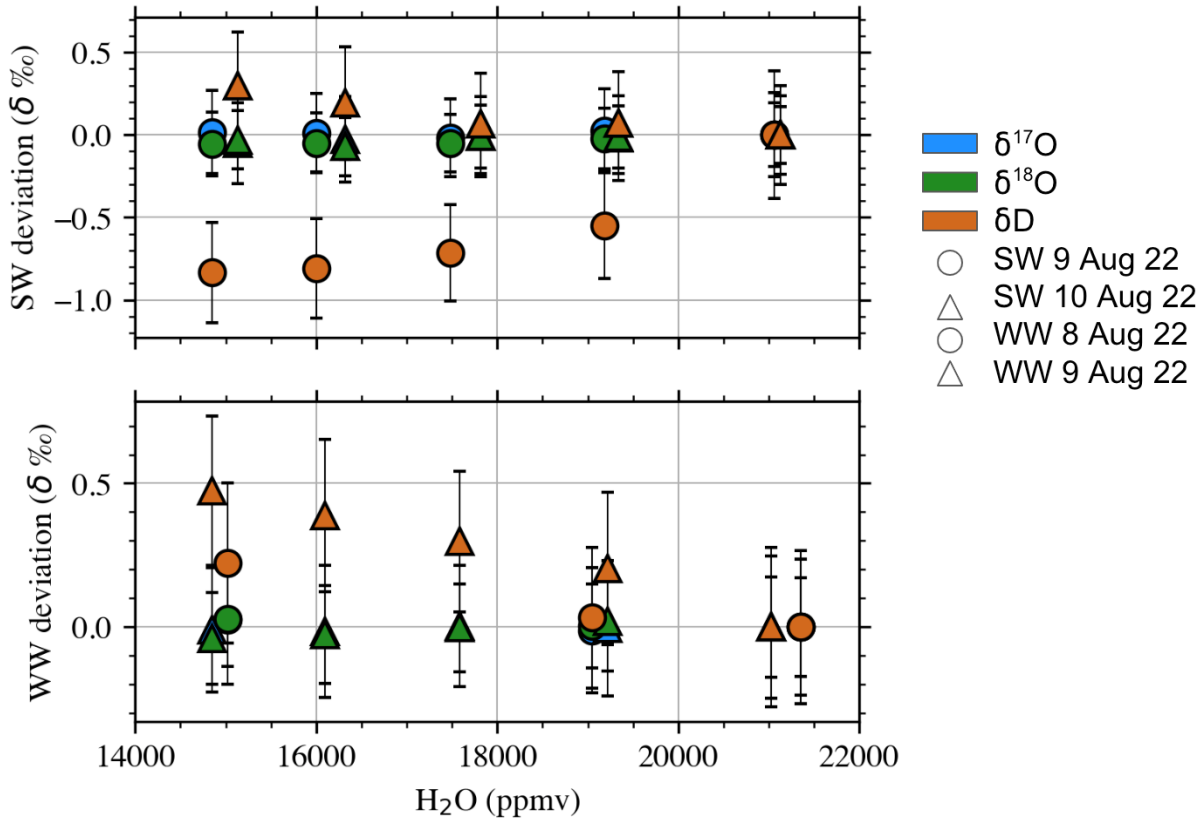


**Figure S1: Humidity - Isotope response for SW and WW standards. The humidity-isotope response was investigated for SW and WW standards between 15000 - 22000 ppmv. The figure shows the deviation of the raw isotopic signal for each standard at different humidity levels. The deviation was calculated against the highest humidity value for each run. Different symbols represent different runs (8 - 9 Aug for WW, 9-10 Aug for SW). Error bars are the standard deviation of the raw signal for each level, as measured at 1 second resolution.**

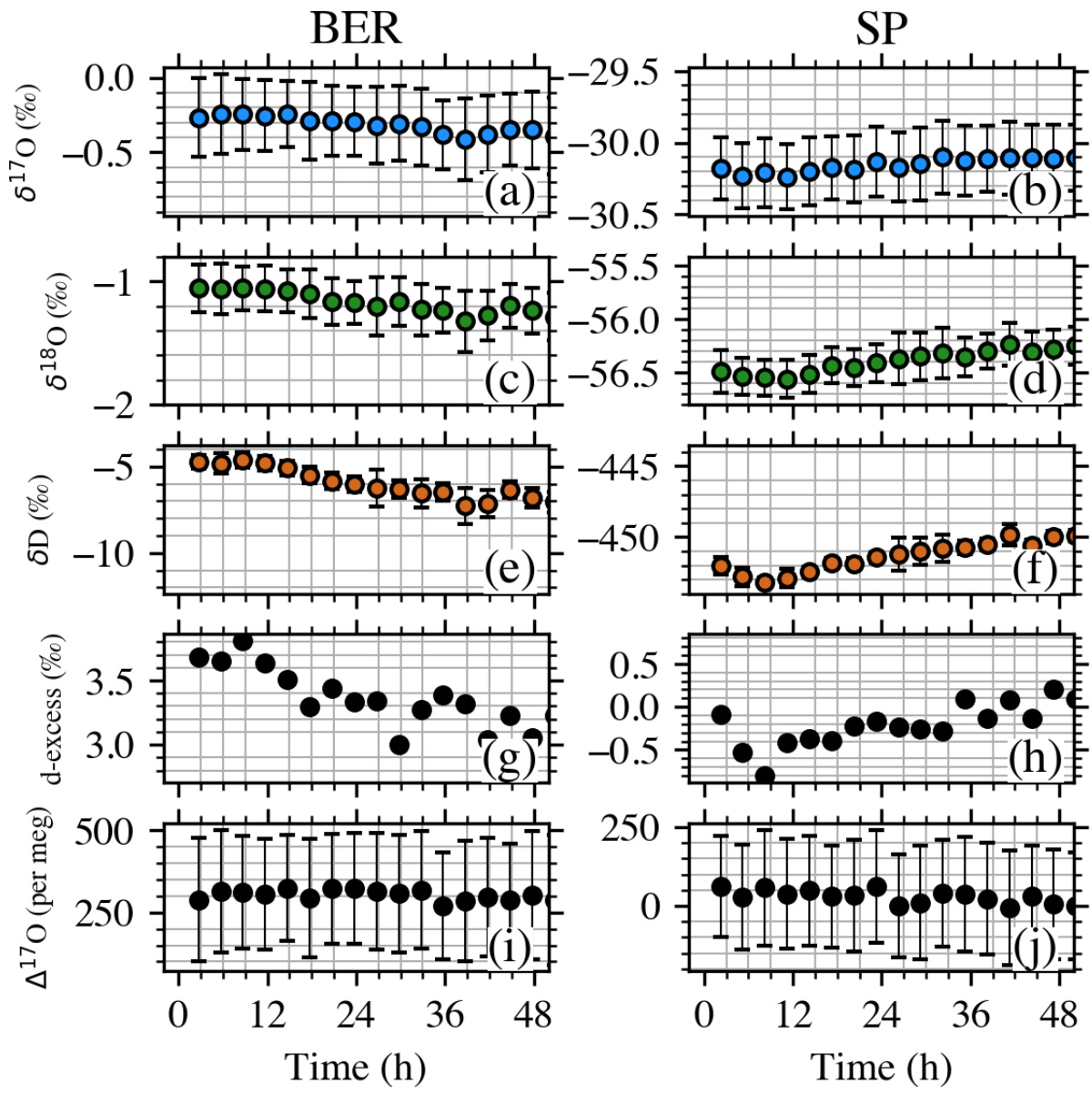


**Figure S2: Pulse train test performed with a single oven and a four position selector. Similarly to Figure 8 in the manuscript, results reported as average ± standard error calculated for the last 5 minutes of $\delta^{17}O$ (a and b), $\delta^{18}O$ (c and d), $\delta D$ (e and f), d-excess (g and h) and $\Delta^{17}O$ (i and j) signals.**