**Supplementary Figures**

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**Figure S1.** Simultaneous peakshape scans of the CO2 mass peaks on a) the MAT 253, and b) the Nu Perspective-1. The Nu Perspective-1 scans have been converted to mV so that the scans are immediately comparable. The older generation MAT 253 shows negative going baselines, most readily seen on the *m/z* = 44 scan, that is not present in the Nu Perspective-1. The flatter baselines of the Nu Perspectives allow for larger and more stable intensities of the higher masses (*m/z* = 47-49) to be recorded.

**Diagram

Description automatically generated**

**Figure S2.** Density curves for *Δ*47 values measured from the anchor standards ETH-1 and ETH-2, and non-anchor standards ETH-4 and Veinstrom on Nu-Perspective-1 (**A-D)**, Nu-Perspective-2 **(E-H)**, and MAT 253 **(I-L)**. In all plots, dashed vertical lines indicate the mean using a 3σ cutoff (purple) and 5σ cutoff (blue); these lines are too close together to be visually distinguished and so the mean values are reported in text. **A)** ETH-1 on Nu-Perspective-1. If using a 3σ cutoff, final mean = 0.2066 ‰, SD = 0.025, N = 85. If using a 5σ cutoff, final mean = 0.2076 ‰, SD = 0.026, N = 86. **B)** ETH-2 on Nu-Perspective-1. Regardless of whether a 3σ or 5σ cutoff is used, final mean = 0.2081 ‰, SD = 0.020, N = 69. **C)** ETH-4 on Nu-Perspective-1. Regardless of whether a 3σ or 5σ cutoff is used, final mean = 0.4552 ‰, SD = 0.020, N = 64. **D)** Veinstrom on Nu-Perspective-1. Regardless of whether a 3σ or 5σ cutoff is used, final mean = 0.6365 ‰, SD = 0.026, N = 102. **E)** ETH-1 on Nu-Perspective-2. If using a 3σ cutoff, final mean = 0.2053 ‰, SD = 0.026, N = 402. If using a 5σ cutoff, final mean = 0.2055 ‰, SD = 0.026, N = 403. **F)** ETH-2 on Nu-Perspective-2. If using a 3σ cutoff, final mean = 0.2060 ‰, SD = 0.026, N = 386. If using a 5σ cutoff, final mean = 0.2065 ‰, SD = 0.028, N =390. **G)** ETH-4 on Nu-Perspective-2. If using a 3σ cutoff, final mean = 0.4411 ‰, SD = 0.026, N = 191. If using a 5σ cutoff, final mean = 0.4420 ‰, SD = 0.027, N = 193. **H)** Veinstrom on Nu-Perspective-2. If using a 3σ cutoff, final mean = 0.6341 ‰, SD = 0.030, N = 322. If using a 5σ cutoff, final mean = 0.6338 ‰, SD = 0.030, N = 323. **I)** ETH-1 on MAT 253. Regardless of whether a 3σ or 5σ cutoff is used, final mean = 0.2063 ‰, SD = 0.020, N = 284. **J)** ETH-2 on MAT 253. If using a 3σ cutoff, final mean = 0.2066 ‰, SD = 0.024, N = 271. If using a 5σ cutoff, final mean = 0.2063 ‰, SD = 0.024, N = 272. **K)** ETH-4 on MAT 253. If using a 3σ cutoff, final mean = 0.4451 ‰, SD = 0.021, N = 208. If using a 5σ cutoff, final mean = 0.4448 ‰, SD = 0.021, N = 209. **L)** Veinstrom on MAT 253. If using a 3σ cutoff, final mean = 0.6315 ‰, SD = 0.022, N = 304. If using a 5σ cutoff, final mean = 0.6318 ‰, SD = 0.023, N = 305.

Shape

Description automatically generated

**Figure S3.** Final density distributions of the standards ETH-1, ETH-2, ETH-3, ETH-4, TV03, and Veinstrom, measured on multiple instrument configurations for *Δ*47 I-CDESvalues **(A-F)** and *Δ*48 values **(G-L)**. We found no statistically significant differences in final values for each of the standards between any of the configurations. *Δ*48 CDES 90 values from MAT 253 are provided for informational purposes only and were not included in analyses. **A)** *Δ*47 values for ETH-1 on Nu Perspective-1, Nu Perspective-2, and MAT 253. **B)** *Δ*47 values for ETH-2 on Nu Perspective-1, Nu Perspective-2, and MAT 253. **C)** *Δ*47 values for ETH-3 on Nu Perspective-1, Nu Perspective-2, and MAT 253. **D)** *Δ*47 values for ETH-4 on Nu Perspective-1, Nu Perspective-2, and MAT 253. **E)** *Δ*47 I-CDES values for TV03 on Nu Perspective-1, and MAT 253. **F)** *Δ*47 values for Veinstrom on Nu Perspective-1, Nu Perspective-2, and MAT 253. **G)** *Δ*48 values for ETH-1 on Nu Perspective-1, Nu Perspective-2, Nu Perspective-EG and MAT 253. **H)** *Δ*48 CDES 90 values for ETH-2 on Nu Perspective-1, Nu Perspective-2, Nu Perspective-EG and MAT 253. **I)** *Δ*48 values for ETH-3 on Nu Perspective-1, Nu Perspective-2, Nu Perspective-EG and MAT 253. **J)** *Δ*48 values for ETH-4 on Nu Perspective-1, Nu Perspective-2, Nu Perspective-EG and MAT 253. **K)** *Δ*48 values for TV03 on Nu Perspective-1, Nu Perspective-EG and MAT 253. **J)** *Δ*48 values for Veinstrom on Nu Perspective-1, Nu Perspective-2, Nu Perspective-EG and MAT 253.