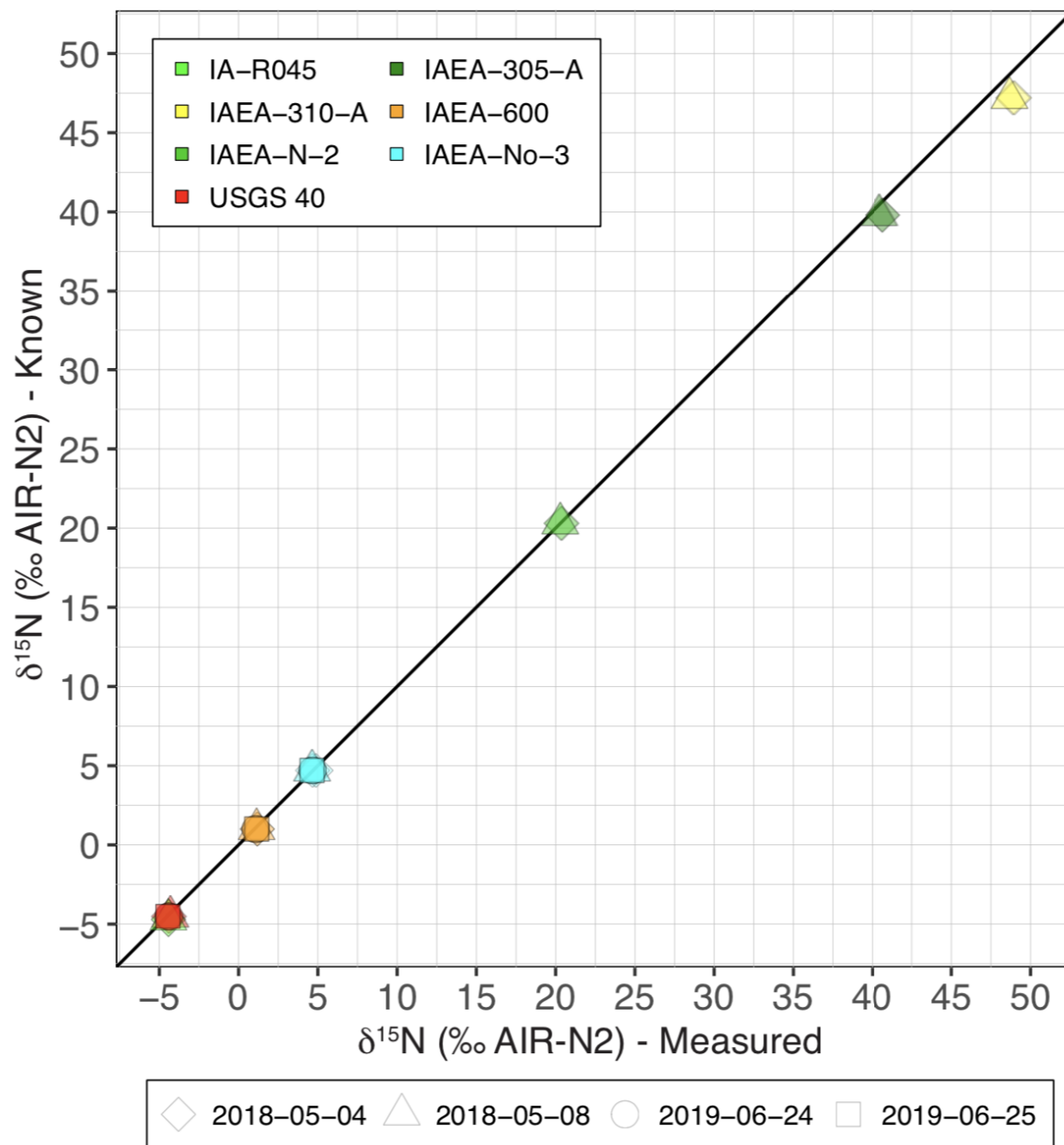
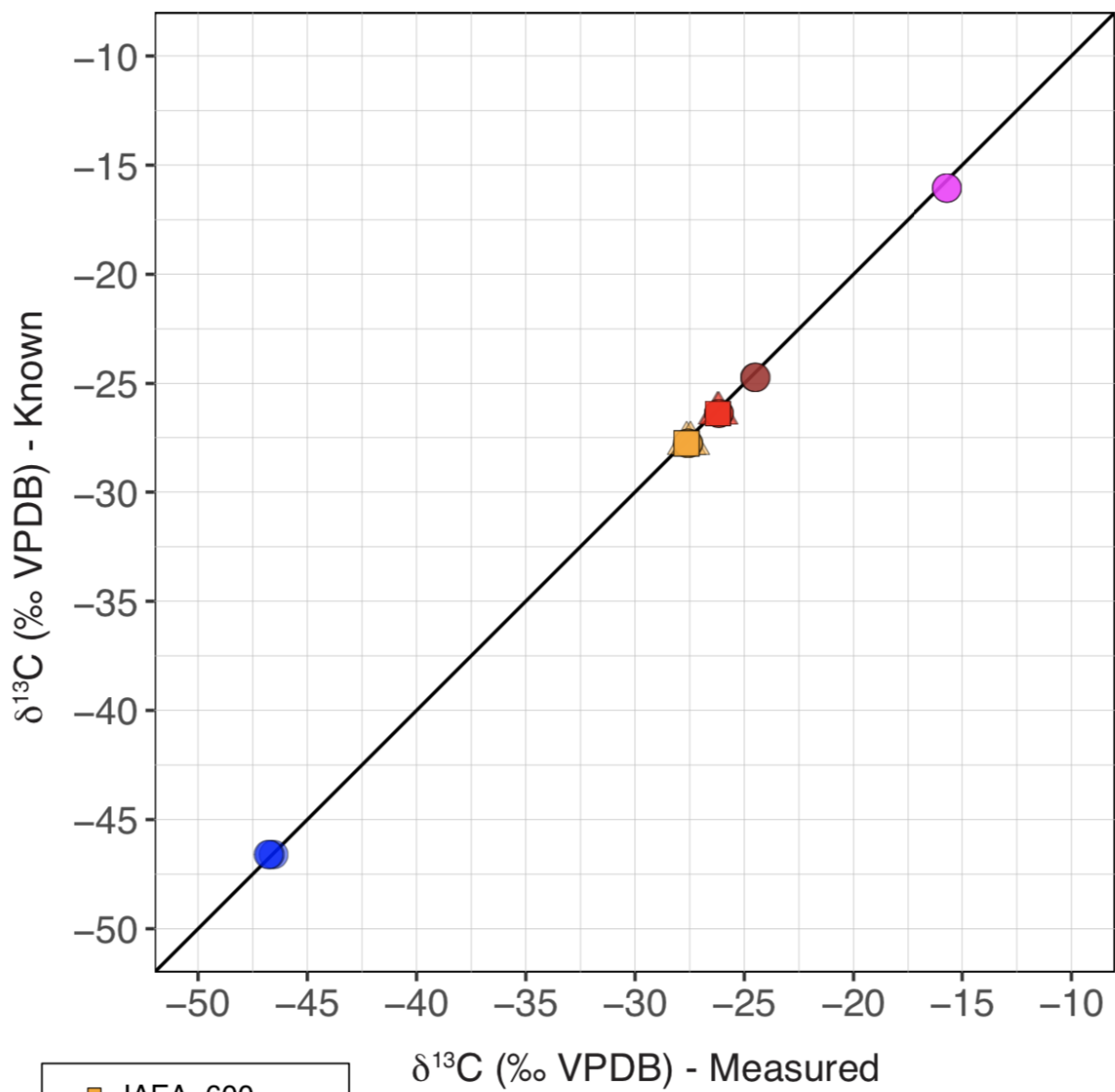


7) How are the $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ measurements referenced to the international standards AIR-N2 and VPDB?

Each sequence of samples that are analyzed include a series of in-house standards that have been calibrated against international standards purchased from certified sources (international standards cannot be run in every sequence due to limited availability). For $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ analyses, one standard, a caffeine powder, is run repeatedly throughout the sequence and used to correct the data for any linear trend over the course of the analyses. For $\delta^{15}\text{N}$ analyses the data are then normalized to the AIR-N2 scale based on the differences between measured and known $\delta^{15}\text{N}$ values for the in-house standards spirulina and caffeine. The performance of the instrument is monitored by assessment of the $\delta^{15}\text{N}$ values of a third in-house standard, urea, which is measured as an unknown. For $\delta^{13}\text{C}$ analyses, the caffeine is also used as a drift standard as is done for $\delta^{15}\text{N}$ measurements. The data are normalized to the VPDB scale using the in-house standards urea and sucrose. The performance of the instrument is monitored by assessment of the $\delta^{13}\text{C}$ values of a third in-house standard, spirulina, which is measured as an unknown. Periodically in the lab international standards are analyzed again as unknowns to confirm the stationarity of the calibration and the stability of all standards. The plots below show results such assessments by plotting the measured value vs. the known value for international standards that were analyzed as unknowns using the lab's typical referencing procedure. In both plots the line is a 1:1 line rather than a regression fit to the data.





- IAEA-600
- IAEA-CH-3
- IAEA-LSVEC
- USGS 24
- USGS 40

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