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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Baffin Bay sea ice extent and synoptic moisture transport drive water vapor isotope (δ^{18}O, δD, d-*excess*) variability in coastal northwest Greenland" *by* Pete D. Akers et al.

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Thank you for the comments Hans Christian,

Further discussion and elaboration on the calibration procedures will be included in a longer upcoming response. But for a quick clarification on your main question, please see the following:

In our paper we stated that we installed our dry air system in August 2019, but that we performed the humidity response calibration in July 2019. This would suggest that our calibration was done before the dry air system. Actually, this due to poor phrasing

in our manuscript. We began installing the dry air system in late July. Once it was running well, we first performed a humidity response calibration with the dry air to check the system and calibrate further results. This and other testing of the SDM was completed by the first of August, when the system was fully set to run on the dry air with an automated standard run cycle. So the humidity response calibration was, in fact, performed with the dry air system, which has a residual humidity under 100 ppmv when no standards are being injected.

We also had performed similar humidity response calibrations using the drierite system before we had the dry air system installed. The results from these runs clearly showed the influence of incomplete drying (as highlighted in Bastrikov 2014), which motivated our installation of the dry air system. Namely, as the humidity lowered, the standard isotopic values trended away from the standard value and toward the intermediate ambient humidity isotopic value. This resulted in calibration curves with opposite trends between the two standards. In contrast, with the dry air system, the humidity response curves are very similar in trend direction and shape for both standards, which is what we expect if we are capturing the innate analytical bias of the machine itself.

I will continue to work on answering your remaining questions for our larger future response. Thank you again!

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