

## Response to review by Anonymous Referee #3

We thank the reviewer many times for the comments made to our manuscript 'Climate controls on water vapor deuterium excess in the marine boundary layer of the North Atlantic based on 500 days of in situ, continuous measurements"

Yes we do agree with the reviewer that part of the 'Materials and method' has been introduced in our previous manuscript 'Continuous monitoring of summer surface water vapor isotopic composition above the Greenland Ice Sheet'. However we do not think it will be possible to shorten the section as the analysis in the rest of the manuscript depends on the individual subsections. Particularly, section 2.4 and 2.5 is of very great importance as this part support the robustness of the measurements. Section 2.3 deals with the drift and as this system does show a quite significant drift compared to other systems. It is important for us to argue why this is indeed a correct and how we adjust for this.

We have in the answered the individual comments below using **green text**

Specific comments,

P2367, 20-25, missing date during "Gat et al., Pfahl and Wernli, and Uemura et al.". **corrected**

p2368, 5, "with the availability of .....provided..... Tremoy et al., 2012).", there is no subject for "provided" **corrected**

P2369, 15-20, "Monthly mean sea surface temperatures" should be "Monstly mean SST". **corrected**

P2369, 20-25, I think the part of "Other measurements carried out at the tower consist of sampling for the Global Atmosphere Passive Sampler Network, continuous lower atmosphere ozone measurements and discrete greenhouse gas sampling for NOAA's Earth System Research Laboratory, continuous measurements of aerosol optical depth for NOAA's Aerosol Robotic Network, and continuous solar radiation measurements for NOAA's Baseline Surface Radiation Network." has no connection with this paper, so it should be deleted.

**It is correct that the other measurements presented here are not directly related to the presented analysis. However we would prefer to keep this section as this paper is also meant to present the setup, data collection routine and outline future study directions.**

P2377, 20-25, the definition of summer and winter is cited from any paper or is defined by the authors? Why use this definition?

We acknowledge that this definition is subjective. As argued in Merlivat and Jouzel 1979 the d-excess in the evaporated vapor depends on the SST. We therefore define a cold period (winter for  $SST < 21C$ ) and a warm period (summer for  $SST > 26C$ ). We wanted to separate the SST as much as possible but also wanted a sufficiently large enough dataset. Hence why we chose this definition.

Fig.11. It's easy to understand the figure if the fit lines use the same color with the dots.

We have tried to change the colors of the linear regression fits but did not get a better/easier way to illustrate the variability.