The paper addresses a significant logistical and scientific challenge in Antarctic climate research: the manual sampling of precipitation for stable water isotope analysis.

Traditional manual sampling presents logistic challenges and exposes samples to post-depositional effects (mainly sublimation and metamorphism) prior to collection, which can alter the snow pristine isotopic values. To overcome this, the authors present an autonomous method for the continuous and combined measurement of both water vapor and precipitation δD using a single laser spectrometer.

The aim is to provide high-temporal-resolution data to better understand the Antarctic atmospheric water cycle, evaluate general circulation models, and improve the interpretation of past climate signals in ice cores.

Specific comments

Line 21 (Abstract) I would not use the term “condensed water” here

Line 30 (Abstract) Is it LMDZ6iso or LMDZ6-iso (with the hyphen) as in other parts of the manuscript? I think it is LMDZ6iso

Line 52-53 change “Adding the water isotopes in the models permits to test and improve the representation of the atmospheric water cycle in the models” with “Adding water isotopes to the models allows for the testing and improvement of the representation of the atmospheric water cycle”

Line 78 Change “weird” with “anomalous”

Line 111-116 How do you differentiate between snowflakes and water vapor signal when using the “snowflake inlet”?

Figure 1 I see that the snow sampling tray is attached to a wood platform, which is higher than the tray itself, plus the sampler is very close to a blue shelter; don’t you think this could heavily interfere with the snow precipitation sampling?

The wind vane, which I suppose turns in line with wind direction, is also placed close to a building which shields the wind (and snow) from that direction

Line 181 The time of the plots seems to go between 15:30 and 16:30, more than between 15:00 and 18:30 UTC

Line 186 Change “In the example shown on Figure 2” with “In the example shown IN Figure 2”

Line 208 What is the “The δD of precipitation”? Does it refer to the snowflake sampling or to the manual precipitation sampling? It is not clear. You should also define δDp and δDcp

Line 228 Change “(Affolter et al., 2014) showed that differences” with “Affolter et al. (2014) showed that differences”

Line 294-295 While it is true that precipitation on the East Antarctic plateau has limited amounts, the frequency is not so low and you have to consider that it is also hard to discriminate between real snowfall events, blowing snow, hoar frost and diamond dust. All the aforementioned events produces snowflakes which, in your automated system, might be misinterpreted as snowfall, if not supported by other types of observations

Line 304-307 I think you have also to consider the input of possible blowing snow inside the inlet without precipitation occurring. A larger diameter inlet could facilitate the snowfall sampling, but it will eventually collect also more wind-drifted snow

Line 309-311 Compared to the system used in this study, the proposed setup would likely be more susceptible to blowing snow contamination

Line 335-336 Change “does not reproduce well” with “does not accurately reproduce” and change “simulations often showing a too smoothed evolution” with “ simulations often showing an overly smoothed evolution”

Chapter 4.2.2 Your claim is that the metric Δ(δD) can be interpreted as an indicator of the temperature or altitude difference between the surface and the level of snow formation, provided that the vertical isotopic gradient remains approximately constant.
Are you sure that the vertical gradient remains constant? Isn’t it possible that precipitation occurs during temperature inversion and thus the vapor equilibrating with snowflakes is enriched in δD compared to the surface vapor you measured? Do you have vertical temperature profiles from the periods you studied? Have you also considered that snowflakes might experience sublimation during their descent?

Line 337-338 Although LMDZ6iso seems to capture pretty well the isotopic composition of precipitation, it looks like it fails to reproduce its variability within the event, especially for the final part of precipitation events; how do you explain that?

Figure 8 The caption should be clearer: Δ(δD) should be better explained and the difference between $\Delta(\delta D_p)$ or $\Delta(\delta D_{cp})$ should be described

Line 375 Change "at 01:00 UTC" with "between 00:00 and 05:00 UTC"

Line 376-377 You have to specify that this rise occurs on April 17th

Line 378-379 You wrote "a first part occurring in April 15th before the cloud descent to ground level with low values of Δ(δD)": first, change "in April 15th with ON April 15th", then you say that the Δ(δD) values are low in this timeframe while, as confirmed in figure 8, and in line 381-382 you state that "In the first part of the event, from April 15th to before 03:00 UTC on April 16th, Δ(δD) shows much lower values, around ~-65 ‰ with a large variability. During this period, the MRR mostly (change "mostly with "mainly") shows high reflectivity values (10-20 dBZ) extending from the surface up to 3 km, with cloud tops exceeding the radar's observational range, indicating that snow particles likely originate from high altitudes."

However, when looking at figure 8, the cloud base height during this timeframe seems quite low (at least after 05:00 UTC on April 15th); how do you explain it? Do you think this precipitation formed in a cumulonimbus (although, to my knowledge, these clouds were never observed at Dumont D'Urville Station, with the exception of pyrocumulonimbus clouds), at a significantly higher height than the cloud base?

Line 384-388 Please specify whether these two maxima in Δ(δD) are either $\Delta(\delta D_p)$ or $\Delta(\delta D_{cp})$: looks like $\Delta(\delta D_{cp})$ to me. You should always specify when referring to either $\Delta(\delta D_p)$ or $\Delta(\delta D_{cp})$, or to both of them

At some point in the paper you should talk about the snow accumulation from the three snowfall cases you studied and possibly compare the measured accumulation with the model output

Line 428-430 It is unclear whether this system can differentiate between drifting and falling snow. If it can, please detail the mechanism used to distinguish the two