L19: I guess here you don't need a hyphen since you are not refering to the noun "sea-ice drift" but to the action "sea ice drifts". But this may be an issue solved during the editoral process anyways.

Indeed. We will remove the hyphen here.

L23: "southern" --> "Southern"

Done.

L83: "We use these ..." --> Perhaps better: "We use brightness temperature measurements at these ..."?

Yes. Done.

L124/125: I am a bit confused about the data sources mentioned for the Southern Hemisphere. Perhaps this confusion is driven by Figure 1 where I find buoy trajectories also plotted for the Southern Hemisphere for the time period covered by the Atlas mentioned. My understanding of an Atlas would be that it contains maps of sea ice motion. I am hence wondering whether and how you read and then translated the buoy position information from the Atlas to produce Figure 1. Could it be that these are basically IBAP buoy trajectories - at least for those years that are not covered by AWI buoys?

This is a good question. The Atlas of Antarctic Sea Ice Drift, developed by Schmitt and colleagues at the Karlsruhe Institute of Technology (KIT), and now archived at the Alfred Wegener Institute (AWI) contained both satellite, wind-, and buoy-derived sea-ice motion fields. We only use the buoy trajectories that were made available as part of the Atlas (https://data.meereisportal.de/eisatlas/HTML/eisatlas_buoys.html). The buoy trajectories are indeed from IPAB and other investigators (https://data.meereisportal.de/eisatlas/HTML/eisatlas_references.html).

We now changed our sentence to read (added text in italics): For Antarctic sea\=/ice we rely on two main data sources: the *buoy trajectories compiled as part of the* Atlas of Antarctic Sea Ice Motion \citep{www:karlsruhe-antartic-icedrift} (1979\=/2000) and the…

Figure 1: Please check whether you need a title above every map. My impression is that this title is not really needed.

The title above each panel is indeed not strictly necessary, we removed them.

L210: "In in" --> "In"

Done.

L225: "force" --> "forces"

Done

L227: "successfull" --> "successful"

Done

L331: "above" --> perhaps better: "poleward of" ?

Indeed. Done.

L474: "northern" --> "Northern"

Done

L513: "he" --> "they"

Done

L517: "quantify" --> "quantity"

Done

L519: Is there a reason why you chose the directions to be opposite to the meteorological notation of u and v components of the wind vector?

There were several issues with our sentence, thank you for pointing this out. We change to:

e.g. latitudinal (aka south-north~~-south~~ or ~~zonal~~meridional) and longitudinal (aka west-east~~-west~~ or ~~azimuthal~~zonal) components.

L531: "a a"

Done

L536: "integrated" --> "integrate"

Done

L558: "wind-derived winds" --> "wind-derived sea-ice displacement vectors"?

Done

L576: "northern" --> "Northern"

Done

Table 4: Since you show winter values only in this table you might consider to get rid of the column "Season" as it contains a constant. The same applies similar tables following.

We could, but we will keep it as it also allows the reader to quickly locate the table he/she is looking for. I also allows to keep the same structure for all tables.

L587-591:

- My reading of ">= -25km" would be all values larger than -25km, i.e. -24km, -23km, -22km, and so forth. Would it make sense to use ">= |+/- 25km|"?

We changed to read “(absolute value larger than 25 km)” to avoid any confusion.

- "1:1 line" --> So far you used "1-to-1 line"

We changed to “1-to-1” line.

- Why do we have difficulties to resolve highly dynamic drift conditions with comparably fine spatial resolution? Wouldn't this be a function of the search window used?

We discuss this further in section 6.1. There are two main aspects to take into account for this underestimation of the highly dynamic drift conditions: 1) the very rapid drift (as measured from buoys) is not representative of the area averaged drift, and 2) our search window is too small for capturing them. The first one relates to imaging spatial resolution (we cannot have much smaller sub-windows with this type of imaging resolution). The second relates to the search window. In section 6.1 we discuss both aspects without being able to rule any of them out. Still, at this stage of the manuscript, we think it is reasonable to mention imaging resolution as one of the explanations for the underestimation. We thus did not change the manuscript.

Table 7 and 8, values of N: Just for confirmation: The fact that the values of N for season Y is not the sum of the values of N for seasons W and S can be explained by the two missing months of the shoulder seasons spring and fall, right?

Indeed.

L680: I suggest to connect once again the Tschudi et al (2020) data set with the NSIDC data record. I can be guessed that you refer to the same product but it is not entirely clear.

We changed to: “Tschudi et al. (2020) present *the NSIDC sea-ice motion dataset v4 that starts in 1978”*.

L699/700: "since all these ... 12.5km" --> In my eyes this is a quite general statement. Especially the NSIDC data product also makes use of the 37 GHz data - especially for SMMR and for the period when SSM/I near 90GHz data were not available - but also in general the Tschudi et al paper states that the drift is derived from both near-90 GHz and 37 GHz data for SSM/I and SSMIS. Hence, there input data partly even have a coarser than 12.5 km resolution.

We rephrased to: However, since *passive microwave imagery from SSM/I and SSMIS with a resolution of 12.5~km at best is the core source of all these data records*, …

Another comment you could make is that the OSI-455 data set is MUCH more homogeneous in terms of the statistics of the input data when comparing the data for both hemispheres. The NSIDC product is based on a highly varying suite of input data, including buoy and AVHRR data for varying periods and coverage in the NH while none of these data are used in the SH. The information content included in their SH drift estimate is therefore considerably less than for the NH. And with that the OSI-455 product is much more consistent and of comparable quality (within the limitations of the approach) for NH and SH - a positive characteristics when using the OSI-455 data set for global model comparisons.

We agree and added the following sentence in section 5.1 (Temporal Coverage): *One of the positive characteristics of the OSI~SAF sea\=/ice drift CDR presented here is thus that the same sources of sea-ice motion are used in the Arctic and the Antarctic, and that the type of satellite imagery is stable through the three decades covered.*

L705/706: A good place to state that you include the information about this variable duration along with the motion product so that the user can check.

We agree and changed to: The duration of each drift vector is roughly 24h from \utctime{12} to \utctime{12}, *but the actual start and end times (and thus durations) of each vector is provided in the product file, since* they vary across the product grid *and* from one day to the next (see \fref{fig:example_dt})

L708: At the same time the weekly product does contain not a single estimate about the quality of the product. This information is only accessible to those users that chose to use the daily product.

This is correct, but we do not feel this is the right place to bring this. We did not change the text.

L762: You could add that this bridging the summer season gap is something also done in the NSIDC data product, combining wind-driven ice motion and buoy motion.

We could, but this was already stated several times, e.g. in section 5 (Comparison to existing CDRs) and in Table 9. We did not change the text.

L767: "bu" --> "but"

Done.

L774: "an" can be deleted?

Indeed. Done.

L791 in context of L781-784: Please check once again whether you really want to make this rather strong statement that your summer sea-ice drift fields ARE generally biased. How significant are the changes reported by Brunette et al.? How much might their conclusions be colored by deficiencies of the PIOMAS model to simulate the full sea-ice thickness distribution correctly (large sea ice thickness is under-, low thickness over-estimated) and other (hypothetical) trends in their forcing data?

The changes reported by Brunette et al. are significant. They indeed use PIOMAS and ERA5, two reanalysis products, which might present biases and trends. However since they tune their free-drift models against on-ice buoy velocities, we can expect that at least part of the biases and trends in SIT are absorbed by the tuning. Concerning the under-ice currents in the Beaufort Gyre region, their results confirmed estimates observed from independent approaches (e.g. mean ocean topography by altimetry). The ramp-up of sea-ice motion was also documented by e.g. Sumata et al. (2023).

Sumata, H., de Steur, L., Divine, D.V. et al. Regime shift in Arctic Ocean sea ice thickness. Nature 615, 443–449 (2023). https://doi.org/10.1038/s41586-022-05686-x

Being a data producer is a delicate balance. One does not want to over- nor undersell one's dataset. We agree with the reviewer that this wording is possibly too strong compared to what we know and compared to the wording we adopted at the beginning of this very section. We thus propose to revise as: "In conclusion, we bring to the attention of the users that our summer sea-ice drift fields might be biased over the 30-years period. "

L794: "our summer .. less biased ..." --> I am ready to second this statement but was wondering what the impact of the buoy drift that is combined with the wind-drift in the NSIDC product could be in this context.

Our statement about the summer bias of the NSIDC product directly stems from the results of Brunette and co-authors (and Sumata et al., 2014). According to Tschudi et al. (2020) (Supplement, lines 36 to 43), the sea-ice drift fields derived from passive microwave enter the final analysis during summer, with the same weights as they have during winter. This might also be an explanation for the low bias of that product during summer. We dit not change our text.

L802-807: This is interesting. It means that your evaluation statistics excludes buoy observations in the Fram Strait and Greenland Sea. Is this the same for the studies that report on the evaluation of the NSIDC product mentioned further up?

No, it is not the same. The impact of excluding buoy observations in the Fram Strait and Greenland Sea is not large, except in months when a lot of trajectories exit the Arctic Ocean through this gate, e.g. the buoy array from the MOSAIC campaign.

L811: "without onwards" ???

We removed "without" and kept only "onwards".

L846: "This is because" --> suggest to add something like "probably", "likely" or the like because at the moment you cannot be 100% certain that this is indeed the reason for your observation.

We added "possibly".