Dear reviewers:

First, we would like to take this opportunity to thank the reviewers for your constructive comments and relevant questions. By adding the answers/revisions to these questions to the revised version of the manuscript, we feel that the quality of the manuscript has been improved. A revised manuscript has been submitted, and all modifications are only included in the revised manuscript for the sake of non-repeat. Answers to your concerns and questions are presented as follows.

Yours sincerely
Minghu Ding

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Respond to the editor comments:
The referees' comments are reproduced in black hereafter, and responses are shown in red.

Reviewer 1:

General comments:

This is a valuable paper, as it introduces a data set that will be of interest to the wider Antarctic climate and weather research community.

It gives an overview over data from an AWS transect from the coast of East Antarctica to the interior of the continent near Dome A. Basic meteorological statistics are presented for the indivual stations, showing temporal and spatial variability. This data set is to my knowledge unique, and, I am sure, will provide an excellent resource for future scientific research.

In its current form the manuscript contains some inconsistencies between the text and the underlying data, that the authors should address in their revision.

Response: It has been modified in the manuscript.

All comments regarding the data, refer to the data as presented in this manuscript, not necessarily of the actual measurements or the underlying data.

Response: We carried out quality control on the original data and did not change the data authenticity and representativeness. The detailed quality control processes and methods have been added Fig.2 and data processing section of the manuscript.

Specific comments:

Title and throughout: "transect" is more appropriate than "network", given the locations of the AWSs. "Network" implies a distribution along longitude and latitude, while the AWSs in this paper are mainly aligned along a north-south gradient.

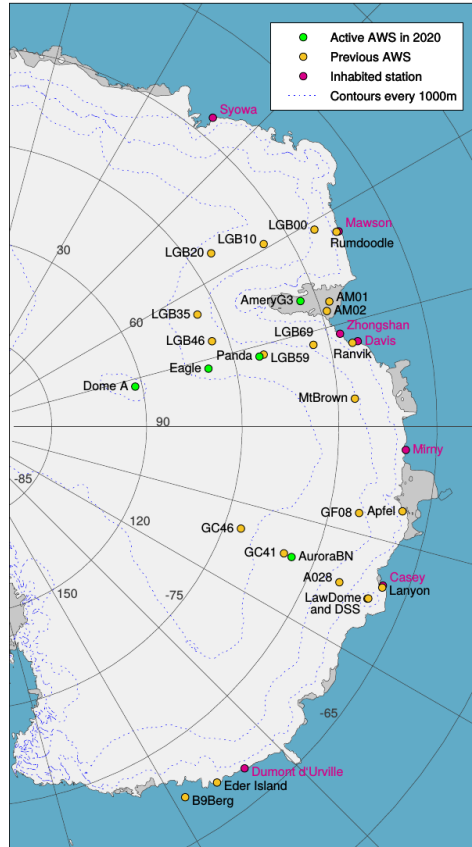
Response: A transect refers to a line or a route.   It does not mean a collection of things (like AWS). In English a network can mean a 2-d array, but it can also mean a group or system of interconnected people or things.   Therefore, we think "Network" is the correct word to use (with its second meaning) NOT "transect".

L33: "capability" may be better in this context than "capacity"

Response: It has been modified.

L119: What do the authors mean by "survived"? They should clarify here, that subsequently AWSs have been installed close to their locations to extend the measurements. This is not entirely clear in the current wording.

Response: It has been replaced as "still operated". "Survived" means by 2012, only 5 AWSs remained in operation, others have been buried by snow or stop operation due to low temperature, e.g., LGB69, it gets buried every 3 years approximately by snow accumulation, subsequently Panda 200 (deployed in 2016) have been installed close to their locations to extend the measurements, LGB59 (73°27'06"S, 76°47'21"E, 2537m), operated between 1994-2004 and follow Panda N (set in 2008) was installed close to their locations to extend the measurements.

This map is from Australian Antarctic Program: http://aws.cdaso.cloud.edu.au/datapage.html; http://aws.cdaso.cloud.edu.au/images/AWS_sites2020.png.

The location of AWS

L143: "all the climate types" is very vague. What are the climate types of East Antarctica? What do the authors mean with that expression?

Response: It has been deleted. The climate type of the East Antarctica is the very field ice weather, but it is mainly divided into the coastal and inland plateau climate zones. What we want to express is that the PANDA transect spans different climate zones, and its rich meteorological observation data is helpful to the research of Antarctica climate change. The description of "all the climate types" is very vague, thus we have been deleted it.

L153: In this context it is important to mention how often it is being dug up and brought to the surface again.

Response: It has been modified. It gets buried every 3 years approximately by snow accumulation, then it is dug up and brought to the surface, stop working by 2008 (Ding et al., 2021).

Reference:

Ding, M., Zhang, T., Yang, D., Allison, I., Dou, T., and Xiao, C. Brief communication: Evaluation of multiple density-dependent empirical snow conductivity relationships in East Antarctica, Cryosphere, 2021, 15, 4201-4206.

L185: That Zhongshan is built on rock does not exclude snow accumulating at the site and the sensor height above surface changing as a consequence.

Response: "except for Zhongshan which is on rock" has been deleted.

L197 ff: Please add a brief description of the pressure sensors that are being used, and where they are installed at the beginning of chapter 2 alongside the description of temperature sensors and wind sensors.

I would find a diagram very useful which should indicate which AWSs cover which period.

Response: It has been added in the manuscript.

"The air pressure sensor for Eagle and Dome A is a Paroscientific 6015A. Panda 100 and Taishan use Vaisala PTB110 and Zhongshan uses Campbell Scientific CS106 to measure air pressure. A Paroscientific Model 215A pressure sensor is used at Panda S, and all other stations use Vaisala PTB210."

The period of AWS observation can be seen in the Table 1.

L224: So far south, in an area of polar day and polar night, an approximately sinusoidal curve for daily temperature is NOT that obvious!

Response: According our dataset, an approximately sinusoidal curve for daily temperature is obvious at the PANDA transect. Our conclusion is similar to that of Zhou et al. (2008) at Dome A, Eagle and LGB 69 during 2005-2007.

Reference:

Zhou, M., Zhang, Z., Zhong, S., Lenschow, D., Hsu, H. M., Sun, B., Gao, Z., Li, S., Bian, X., and Yu, L. Observations of near-surface wind and temperature structures and their variations with topography and latitude in East Antarctica, Journal of Geophysical Research: Atmospheres, 2009, 114(D17).

L227: Why is this? Could the authors expand on this?

Response: It has been modified. The standard deviation of the diurnal temperature oscillation is somewhat smaller at coastal region compared to that at dome region, which

may be a result of the stronger winds at inland and coastal that mix the effects of surface heating or cooling over a greater depth (Zhou et al., 2008).

In addition, coastal region also effected by ocean, thus the standard deviation of mean air temperature diurnal variations gradually increases from coastal to dome region. In addition, the cloud also plays a role in this regularity, cloudy days are more frequent at the coastal area while clear-sky conditions prevail at inland plateau (van den Broeke et al., 2004).

Since this paper is a introduce data, we have not explained it in more detail in the manuscript. If you insist, we will fain to added it in the manuscript.

Reference:

Zhou, M., Zhang, Z., Zhong, S., Lenschow, D., Hsu, H. M., Sun, B., ... & Yu, L. (2009). Observations of near‐surface wind and temperature structures and their variations with topography and latitude in East Antarctica. Journal of Geophysical Research: Atmospheres, 114(D17).

Van Den Broeke, M., Reijmer, C., & Van De Wal, R. (2004). Surface radiation balance in Antarctica as measured with automatic weather stations. Journal of Geophysical Research: Atmospheres, 109(D9).

L228: What do the authors mean by "coreless winter"?
The authors explain this with the words "there is no distinctive minima during austral winter". But is this true for these AWSs? I see a distinct minimum at each AWS in Figure 4.
Some of the AWS measurements go back over twenty years. Are calculated means over such a period meaningful? Would it not make sense to detrend these time series first?
Response: Coreless winter: the degree of temperature has not significant minimum and the temperature traces are rather flat, it is usually expressed by corelessness. Corelessness is defined as the amplitude ratio of the second to the first harmonic of the annual course of the temperature variation. In all cases the amplitude of the second harmonic is more than 25% of the first harmonic, a typical mark of a "coreless winter". The corelessness factor increases with elevation and distance from the coast, from 0.26 at Zhongshan to 0.43 at Dome A (Allison et al., 1993; Chen et al., 2010; Ma et al., 2010).
From the perspective of mathematical theory, the trend calculation is generally more than thirty years, and twenty years is too short to calculate the trend, only its change can be seen. Some of the ESSD journals are similar to our articles and no detrend processing was

performed on the data, e.g., Maturilli et al., 2013; Wawrzyniak and Osuch, 2020. If you insist detrend calculation, we will be fain to calculated and added it in the manuscript.

Reference:

Allison, I., Wendler, G., and Radok, U. Climatology of the East Antarctic ice sheet (100 E to 140 E) derived from automatic weather stations. Journal of Geophysical Research: Atmospheres, 1993, 98(D5), 8815-8823.

Chen, B., Zhang, R., Xiao, C., Bian, L., and Zhang, T.: Analyses on the air and snow temperatures near ground with observations of an AWS at Dome A, the summit of Antarctic Plateau, Chinese Science Bulletin, 2010, 55(11), 1048-1054.

Ma, Y., Bian, L., Xiao, C., Allison, I., & Zhou, X. (2010). Near surface climate of the traverse route from Zhongshan Station to Dome A, East Antarctica. Antarctic Science, 22(4), 443-459.

Wawrzyniak, T., & Osuch, M. (2020). A 40-year High Arctic climatological dataset of the Polish Polar Station Hornsund (SW Spitsbergen, Svalbard). Earth System Science Data, 12(2), 805-815.

Maturilli, M., Herber, A., & König-Langlo, G. (2013). Climatology and time series of surface meteorology in Ny-Ålesund, Svalbard. Earth System Science Data, 5(1), 155-163.

L233: The authors say that the surrounding ocean may bring warm, moist air masses. How far inland would the authors expect such a signal to be detectable? Weather systems may bring maritime air land inwards, but without such systems the maritime influence won't reach further than 50 to 100km, I would say.

Response: According previous research and our results found that weather systems can bring maritime air land inwards, can reach the inland plateau and even the dome area (Genthon et al., 2013; Qin et al., 2016; Ding et al., 2020; Ding et al., 2022). In addition, without the weather systems, the effect of surrounding ocean is very limited, but we don't carried out relevant research and not sure how far inland we can detect the influence of warm and humid air masses from the oceans. If you insist, we will be glad to analyzed it in the manuscript.

Reference:

Genthon, C., Six, D., Gallée, H., Grigioni, P., & Pellegrini, A. (2013). Two years of atmospheric boundary layer observations on a 45-m tower at Dome C on the Antarctic plateau. Journal of Geophysical Research: Atmospheres, 118(8), 3218-3232.

Qin, T., Lixin, W., & Cheng, L. (2017). The statistic and variance of cyclones enter in scientific investigation station of China in Antarctic. Haiyang Xuebao, 39(5), 44–60.

Ding, M., Yang, D., van den Broeke, M. R., Allison, I., Xiao, C., Qin, D., & Huai, B. (2020). The surface energy balance at Panda 1 Station, Princess Elizabeth Land: a typical katabatic wind region in East Antarctica. Journal of Geophysical Research: Atmospheres, 125(3), e2019JD030378.

Ding, M., Xiao, C., and Qin, D.: Explosive warming event in Antarctica on 18 March 2022 and its possible causes. Advances in Climate Change Research, https://doi.org/10.12006/j.issn.1673-1719.2022.068, 2022a.

L277: Earlier (L141 - 142) the authors say that the inland section of the transect is influenced by katabatic wind! Which one is it?(1)

As the Relative Humidity is dependent on the Air Temperature, it would be more meaningful to calculate and analyse the Absolute Humidity. Many of the phenomena that the authors describe in this section are likely caused by changes in the temperature rather than by changes in the actual humidity content of the air.(2)

Can the authors give an explanation why Panda S is on average more than 10K warmer than Kunlun, which is at a similar altitude and further north? This seems a bit dubious to me.(3)

Have the authors considered how the latitude, particularly of the southern most AWSs, influences the wind direction? There is no southerly wind at the south pole. It would make more sense to split the wind direction into the meridional and longitudinal components and analyse them separately?(4)

Response: (1)The inland section of the transect is strongly influenced by katabatic wind, it includes Panda 300, Panda 400, Taishan and Eagle. Meanwhile, Zhongshan, Panda 100 and Panda 200 are also affected by katabatic wind, but this belong to coastal region.

(2)Yes, you are right, many of the phenomena in this section are likely caused by changes in the air temperature rather than humidity, we do used air temperature for analysis, e.g., characteristics of diurnal variation of wind speed.

(3)Sorry, according standard of data process in Sec.2.2, if more than 25% data (3 months) within one year are missing, the annual data is considered a missing. The data of Panda S is missing for more than 4 months (from May to September) every year. Thus, the annual information of Panda S is an error and has been deleted.

(4)We don't consider the latitude. The southern most AWS is Panda S (82.33°S) and still about 800km away from the South Pole. Meanwhile, as can be seen from the wind rose,

there is still southern wind at Panda S. Therefore, we think don't split the wind direction into the meridional and longitudinal components and analyze them separately. We will be glad to modify again, if understand was wrong.

L327: This section really needs a surface pressure chart or similar for the reader to properly understand the processes.
Response: The mean 500 hPa geopotential height (left) and sea level pressure chart has been added in the manuscript.

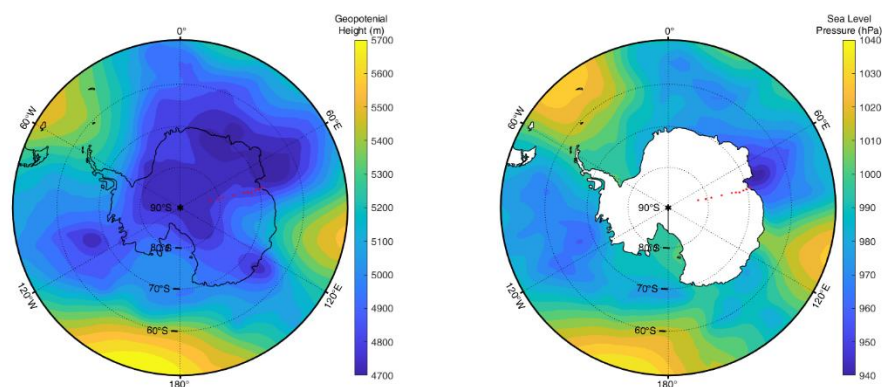



Figure 13. The mean 500 hPa geopotential height (left) and sea level pressure (right) on 12:00 1 August (red dot: surface weather station).

L346: The presented case study does not show that these AWS observations can play an important role in weather forecasting on the Antarctic ice Sheet. The case study shows that the mesoscale circulation is reflected in the measurements, but how this aids weather **forecasting** in the region remains unclear.
Response: It has been modified.

Data availability should come after the Conclusions!
Response: No, according ESSD's submission guidance and papers, data availability should precede conclusions.

Technical corrections
L110: Either "The first stations were deployed…" or "The first station was deployed…"

Response: It has been modified.

L118: I would find a reference to table 1 here useful.

Response: It has been modified.

L132: "site" usually refers to a single location, i.e. one point. "area" or "region" would be better.

Response: It has been modified.

L133: Data "pre-processing" seems more appropriate here.

Response: It has been modified.

L138: remove "highly"

Response: It has been removed.

L146: Please introduce what LGB stands for directly here.

Response: LGB: Lambert Glacier Basin. The introduce has been added to the location where it first appeared.

L151 replace the second "has" with "been".

Response: It has been modified.

L152: Put a full stop at the end of this sentence, and start a new sentence "It gets buried … "

Response: It has been modified.

L153: add "by snow accumulation"

Response: It has been modified.

L153 Rephrase the sentence "This area also has….". Can the authors please clarify what they mean by "ice movement", and please provide a typical accumulation rate.

Response: It has been modified.
"This station was in a region of high ice velocity (17.7 m a-1) and high accumulation rate (199 kg m-2 a-1 for 2002-2003) (Zhang et al., 2008; Ma et al., 2010; Ding et al., 2011; 2015) and it became buried approximately every 3 years, requiring digging up and

redeploying on the surface. It stopped operating by 2008 (Ding et al., 2021a). Since it was difficult to maintain an AWS at the original site, PANDA 200 was deployed 200 km from the coast in December 2016, and is considered as a replacement AWS for LGB 69."

L156: Insert "km from the coast and *is* considered…."
Response: It has been modified.

L157: "during the CHINARE 21th" Do the authors mean "during the 21st CHINARE"?
Response: It has been modified.

L158: Start a new sentence after "coast"
Response: It has been modified.

L158: The sentence about the lowest temperature does not belong in this chapter.
Response: It has been modified.

L162: "only intermittently"
Response: It has been modified.

L162: Maybe rephrase: "The other AWSs were manufactured by … and were deployed during 2012 (AWS a, b and c), and 2019 (AWSs d, e, f..) respectively."
Response: It has been modified.

L 165: I would suggest starting a new sentence: "The data is not stored internally."
Response: It has been modified.

L174: This sentence needs rewriting, as it does not make sense at the moment. I would also suggest splitting it to make it clearer.
 "The AWSs that were designed by … use a HMP15 … to measure … and relative humidity. Panda S and ??? use a Weed wire bridge….and Vaisala HMP35A. Eagle and Dome A use ….. "
Response: It has been modified.
"The AWSs that were designed by the Chinese Academy of Meteorological Sciences use a Vaisala HMP155 resistance probe to measure air temperature and relative humidity.

Panda S use a Weed wire bridge and Vaisala HMP35A. Eagle and Dome A AWSs use FS23D thermistors and HMP35D humidity probes (Xiao et al., 2008)."

L 177: "Eagle and Dome A AWSs … "
Response: It has been modified.

L178: "freeze" is more accurate than "stall".
Response: It has been modified.

L179: Start a new sentence: "The other AWSs are equipped …"
Response: It has been modified.

L180: Which AWSs do the authors refer to with "some of them"? This should be made clear.
Response: It has been modified.

L181: Start a new sentence: "Further details of the sensors …"
Response: It has been modified.

L183: replace "super" with "extremely"
Response: It has been modified.

L183: What do the authors mean by "fieldwork"? Do the authors mean the AWS deployment?
Response: Yes, it has been modified.

L190 "… may lead to duplicated records or time dislocation."
Response: It has been modified.

L190: In what way is Figure 2 is relevant at this point? I suggest removing the reference to Figure 2 here.
Response: It has been deleted.

L192/193: This assumption does not allow for temperature inversions that are quite frequent over snow and ice!

Response: We removed mention of logarithmic wind profile. Because of anemometer problems wind profiles are seldom good for checking. But checking the temperature lapse rates is useful.

L196: The authors say that the height of the sensors above the snow surface is not measured. How can they correct for it then?

Response: Due to lack of observation of the snow accumulation, we don't correct the height of sensors, and we reference initial height. In addition, the height of sensors might change with snow accumulating. The correction method to this error have been introduced in Ma et al. (2008) and Smeets et al. (2018).

Reference:

Ma, Y., Bian, L., Xiao, C., Allison, I.: Correction of snow accumulation impacted on air temperature from automatic weather station on the Antarctic Ice Sheet. Advance in Polar Science, 20(04): 299-309, http://ir.casnw.net/handle/362004/7877, 2008.

Smeets, P. C., Kuipers Munneke, P., Van As, D., van den Broeke, M. R., Boot, W., Oerlemans, H., Snellen, H., Reijmer, C.H., and van de Wal, R. S.: The K-transect in west Greenland: Automatic weather station data (1993-2016), Arctic, Antarctic, and Alpine Research, 50(1), S100002, https://doi.org/10.1080/15230430.2017.1420954, 2018.

L197: Should that say "… the logger boxes were buried", as the authors are talking about more than one AWS?

Response: It has been modified.

L200 "Similar to …"

Response: It has been modified.

L204 I would replace "the" with "this"

Response: It has been modified.

L206: no comma after 18:00

Response: It has been modified.

L207: What do the authors want to say with "for consistency"? This is not clear. I would remove it, or clarify.

Response: It has been modified.

L207 better "monthly and annual values …"

Response: It has been modified.

L209 replace "spans" with "periods". To use the plural of "span" is very unusual.

Response: It has been modified.

L216: ".. at 6 m and 2 m height …" It seems counterintuitive, but in such a sentence this would be the correct way to say it in (British) English.

Response: Ok, it has been modified.

L217: "… the anemometers with a vertical axis at Eagle, Dome A and Panda S often froze, which leads to … "

Response: It has been modified.

L219: "We used a different type of anemometer…"

Response: It has been modified.

L220: "…. wind speed and direction data for these three AWSs."

Response: It has been modified.

L223: "The mean diurnal …"

Response: It has been modified.

L225: what does "LST" stand for?

Response: LST denote Local Standard Time, it has been added in the manuscript.

L229 "minimum" not "minima"

Response: It has been modified.

L232: "… the Antarctic Ice Sheet …"

Response: It has been modified.

L245: The authors mention trends here. I recommend to only explicitly mention significant trends in the text, and then also give their level of significance.

Response: It has been modified and the level of significance has been added in figure caption.

L251: Please explain the gap shown in the Panda S data in Figure 6!
Response: The data of Panda S from May to September are missing due to the influence of observation environment (e.g., low air temperature).

L256: The data from Dome A shows a clear double maximum, so NOT a clear seasonal cycle.
Response: It has been modified.

L257: Trends in Figure 7: When adding trend lines to a plot, please always give the trend value and its significance either as inset in the plot or in the caption.
Response: The trend values have been added to plot and its significance has been added to the caption.

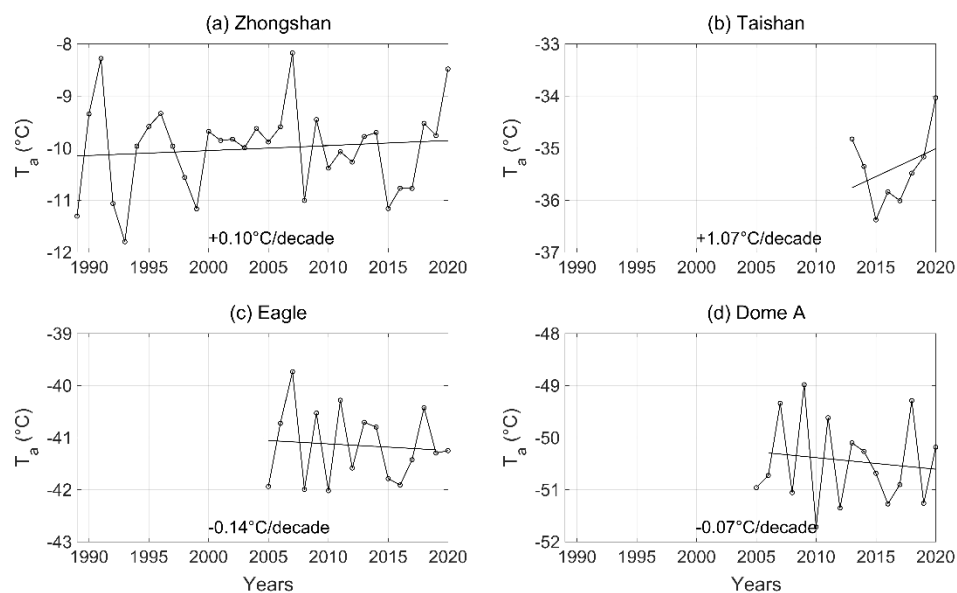



Figure 7. Interannual variation of relatively humidity at Zhongshan (p<0.05), Taishan (p<0.05), Eagle and Dome A.

L259: The auhtors say here that RH is well correlated to air temperature – which is exactly why it makes more sense to analyse absolute humidity!
Response: Yes, you are right. We will earnestly consider your constructive suggestions in the later research.

L264: "… the seasonal cycle becomes clearer."
Response: It has been modified.

L267: "submerged" is not an appropriate word here. Maybe use "hidden"?   Or "The annual oscillation is superimposed on this"
Response: It has been modified.

L272: "shown" not "showed"
Response: It has been modified.

L286: The atmosphere is stably stratified, it's not the wind.
ere is evidence … at all AWSs except x, y and z."
Response: It has been modified.

L290: I suggest to rephrase this to "There is evidence … at all AWSs except x, y and z."
Response: It has been modified.

L293: "… along a slope… "
Response: It has been modified.

L296: I suggest: "… the wind speed decreased …"
Response: It has been modified.

L298: "exception: "
Response: It has been modified.

L299: "… where the katabatic effect is weakened."
Response: It has been modified.

L300: This sentence in its current form is unclear. I do not understand what the authors are trying to say here.
Response: Sorry, it has been deleted.

L304/305: End the sentence after "2020", and remove the entire text in line 305.
Response: It has been modified.

L306: What about other long data sets such as Eagle, Dome A and Panda S?

Response: According standard of data process in Sec.2.2, if more than 25% data (3 months) within one year are missing, the annual data is considered a missing value. The data of Eagle, Dome A and Panda S is missing for more than 3 months every year, thus removed these sites and only analysis Zhongshan and Taishan.

L309: I suggest rephrasing: "We only analysed wind direction for the months from September to February".

Response: It has been modified.

L312: "regular" is here probably better than "stable"

Response: It has been modified.

L312: "determine the wind speed on the ice sheet"

Response: It has been modified.

L313: remove "which is thus mainly from NE to SE".

Response: It has been modified.

L314: I suggerst rephrasing: "… dominates, alos resulting in winds from NE to SE (…)."

Response: It has been modified.

L317: I suggest reordering to: "16 years of observations result in no prevailing wind direction."

Response: It has been modified.

L322: Depending on what the authors are trying to say, I suggest either "The local weather conditions are reflected in the meteorological surface measurements." Or "The local weather conditions can be deduced from the meteorological surface measurements."

Response: It has been modified.

L324:_"… which indicates the occurrence of a prominent blocking event."

Response: It has been modified.

L326: "…was analysed using the Panda AWS transect dataset."

Response: It has been modified.

L333: replace "with" with "at"

Response: It has been modified.

L334: As the figure clearly shows, the pressure drops at Eagle on August 1st, not before Augus t 1st.

Response: We described the drop of air pressure before August 1 occurred from Zhongshan to Taishan, not include Eagle.

L336: Eagle shows clearly a drop in pressure!

Response: Yes, Eagle also shows clearly a drop-in pressure, but the change of air pressure is different from those of Zhongshan-Taishan. Before 1st August, there was a drastic drop in air pressure at AWSs from Zhongshan to Taishan, but the air pressure drops at Eagle on August 1st.

L338: "…reaching the highest values at local noon."

Response: It has been modified.

L338-L340: These lines really need to be removed! To give changes of temperature and wind speed in percentage is absolutely meaningless!

Response: It has been deleted.

L342: What does "became flat in the geopotential field" mean? Please rephrase!

Response: It has been rephrased.

"The southern section of the Indian Ocean subtropical high became weak in the geopotential height anomaly field, and the blocking event move eastward and eventually dissipated along the coast."

L342: "… and the blocking event moved … and eventually dissipated along …"

Response: It has been modified.

L343: Where did the blocking high dissipate? Over the coast or over the ocean?

Response: It has been modified. The blocking event move eastward and eventually dissipated along the coast.

L344: "… warming event at Dome C (..)."
Response: It has been modified.

L349: What do the authors mean by "other AWSs"?
This whole section should be rephrased for clarity.
At the time of the review the AWS data does not come up when using the map tool to search for data sets, so I cannot ascertain whether or not the data are already available or not.
Response: It has been modified. Previously, the data of Dome A and Eagle have been published on National Arctic and Antarctic Data Center (https://doi.org/10.11856/SNS.D.2021.006.v0 and https://doi.org/10.11856/SNS.D.2021.007.v0, respectively), but the website has been stopped. The Eagle and Dome A data has been published on the AAD: http://aws.cdaso.cloud.edu.au/datapage.html. Panda S data has been posted on the data portal of the University of Wisconsin: https://doi.org/10.48567/1hn2-nw60 (AMRDC Data Repository). We have been re-published the data of others AWS on the A Big Earth Data for Three Poles (https://doi.org/10.11888/Atmos.tpdc.272721).

L355: "..from the coastal Zhongshan AWS to Panda S in the interior of the Antarctic continent …."
Response: It has been modified.

L359: The observed parameters are not enough to derive the surface energy balance. There are no radiation measurements nor measurements of latent and sensible heat flux or of the ground heat flux! Please remove this claim.
Response: It has been deleted.

L361: "… diurnal, monthly and annual averages as well as long term changes have been…"
Response: It has been modified.

L363: if the differences are statistically significant, then this should be mentioned in the manuscript. Currently this is not the case. Alternatively, I suggest using "distinctly" instead of "significantly" to avoid implying statistical significance.

Response: It has been modified.

References: The manuscript cites Allison et al 1998, which is currently missing from the References.

Response: It has been added in Reference.

Reference:

Allison, I. (1998). Surface climate of the interior of the Lambert Glacier basin, Antarctica, from automatic weather station data. Annals of Glaciology, 27, 515-520. doi:10.3189/1998AoG27-1-515-520.

Figures: Add trends and significance level (or lack of significance) to all plots that show trendlines!

Response: The trends and significance level have been added to figure and its caption, respectively.

Figure 7: Caption: Interannual variation of Relative Humidity

Response: It has been modified.

Figure 11: Why is the plot for Taishan included here? It does not add any information.

Response: It has been modified. The trend values and significant levels have added to the manuscript. We will be glad to modify again, if change didn't follow your intention.

Figure 12: "Time series of … "

I suggest that the authors rearrange the plots in Figure 12 to have one column per parameter, and then arrange the AWSs from top to bottom in rows according to their latitude.

Response: It has been modified.

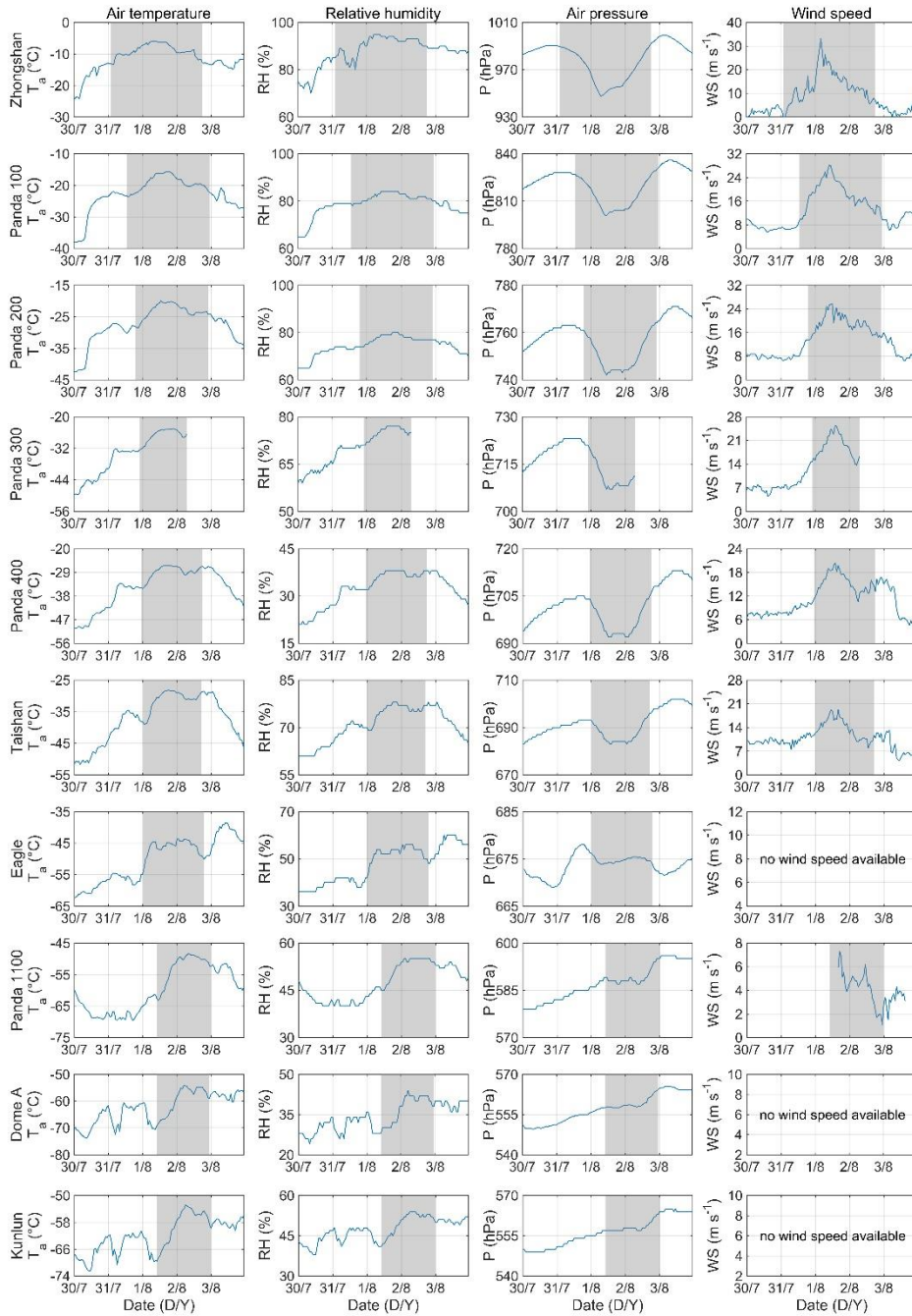



Figure 12. Time series of air temperature, relative humidity, air pressure and wind speed at AWS of the PANDA transect (except Panda S) from 00:00 30th July to 23:00 3rd August 2020 (UTC); gray zone: block event.

Table 2: Please include a column with the number of values that have gone into calculating these values, as this will vary from AWS to AWS.

Response: It has been added in the manuscript.

Table 2 The mean values of meteorological variables on AWSs in the PANDA transect

Stations\ elements	Air temperature /°C	Relative humidity/%	Pressure /hPa	Wind speed /m s^{-1}	Number of hourly values
Zhongshan	-10.0	58	985	6.9	184695
Panda 100	-21.6	73	827	11.2	21216
Panda 200	-26.5	72	763	10.9	40010
Panda 300	-30.0	68	726	10.4	13811
Panda 400	-32.0	34	710	10.0	13783
Taishan	-35.4	67	699	10.9	74893
Eagle	-41.2	54	683	3.6	139608
Panda 1100	-47.7	55	603	3.6	39648
Dome A	-50.5	42	575	2.9	140484
Kunlun	-50.8	55	574	3.9	39515
Panda S	-	-	-	-	-

Reviewer 2:

This is a valuable paper relating to this data set that I am sure will be widely used.

Amélie Kirchgaessner has already made many useful suggestions for changes to the paper so I will not repeat those.

A few comments that I have are:

The link to READER on Line 127 should be changed to: https://www.bas.ac.uk/project/reader/
Response: It has been modified.

I think it would be best to remove lines 244-248 which refer to the temperature trends as these datasets are not enough for these to be statistically significant.
Response: It has been deleted.

In the section on relative humidity is not clear if this is with respect to water or with respect to ice so this should be made clear.
Response: The relevant description has been added to "2.1 Observation region and site descriptions" section. By consulting the sensors parameters, we found that the air temperature and relative humidity sensor is an integrated sensor, which itself considers the conversion of ice and water form. We don't consider the conversion of the RH data with regards to water or with regards to ice. The detail information with humidity and temperature probe, please see: https://www.vaisala.com/zh/vaisalahumicapr-

technology.