The Cryosphere Discussions

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Comment on tc-2020-375

Anonymous Referee #1

Referee comment on "Arctic sea ice anomalies during the MOSAiC winter 2019/20" by Klaus Dethloff et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2020-375-RC1, 2021

"Arctic sea ice anomalies during the MOSAiC winter 2019/20" by Klaus Dethloff et al., submitted to The Cryosphere

(General comments) This is an interesting paper describing the sea ice condition related to the atmospheric circulation patterns as indicated by AO, just in time to the conclusion of the MOSAiC expedition. Basically, the manuscript is well written and readable; however, some figures (4, 7, and 16) are too small and difficult to understand. Also, coordination of figures was better to be the same. If you take the one in Figure 12 as a basis, then Figures 2, 3, 5, 10, and 11 top (even different from 11 bottom) should be in the same one. Explanation of Figure 6 is not enough, and I don't understand any advantage showing these two graphs. Are the "Target diagram" and "Taylor diagram" common style for statistical science? Also, "normalized bias", "normalized uRMSD", "normalized standard deviation", and "REF" are not explained. Table 1 seems sufficient for necessary information. Summary and Conclusion section does not display conclusion clearly.

(Specific comments) - Line 165-167: Short description of the way (concept) to derive sea ice thickness from satellite data is better to be made for CryoSat-2/SMOS data, since most references are only technical reports, not easy to refer. - Line 208: Title for 3.1 should be analogous/ comparable to that of 3.2, such as "Analysis of atmospheric and sea ice condition in ERA-5 and satellite data" or so. The present title does not reflect 3.1.1. - Line 216: There is no explanation for Figure 1(b). Why (b) is based on 1979-2000 ERA-5? - Line 219, Figure 2: Figure 2 is unbalanced and if so, please make some indication in the figure months and Δp or ΔT and so on. - Line 255-257: It is difficult to read "1.3 m" as the maximum from Figure 4 (already point out in the general coment). Even the color bars are different between Figure 3 and 4! - Line 265-267: It is difficult to follow these two sentences because we have no information on the satellite algorithm (as noted above). - Line 274: What is "domain-averaged bias"? - Line 277: "Anomalies" mean difference from the mean 2010-2019? (as indicated in the captions of Figure 7). - Line 285-286: "ship-based measurements" mean EM measurements written on Line 176, then it better to describe so. - Line 288-290: Is there any other bias of ship-based EM measurements, such as calibration error or so? - Line 297-301: We are not sure where you are talking about since southern part was mostly covered with clouds in Figure 9. The small red

letters could not read in the infrared image (left). In the BS, we could not see the surface/ leads? - Line 313-329: This paragraph is not clear to be understood. Figure 10 is also difficult to read. Small black arrows indicate transpolar drift, then, what are large black thin arrows? - Line 333: What is “OSI-SAF low resolution sea ice motion data”? Some explanation is needed. - Figure 11: What are large black arrows similar to be in Figure 10. - Line 350: Bering Street ---□ Bering Strait? - Line 363 and 369: TVT and DVT, too much abbreviations. We can accept for place names or common parameters, but physical phenomena should be written down? - Line 401-403: Might be an important message; however, not clear from the Figure 15. Difference is seen rather in the central Arctic. - Line 416-419: These message should be compared with Figure S2.