

Comment on **essd-2021-341**

Anonymous Referee #1

Referee comment on "Observations of marine cold-air outbreaks: a comprehensive data set of airborne and dropsonde measurements from the Springtime Atmospheric Boundary Layer Experiment (STABLE)" by Janosch Michaelis et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-341-RC1>, 2021

The authors describe in this paper the quality control of dropsonde and aircraft measurements, done in the STABLE experiment. Additionally, a brief overview about the scientific results of the measurements are given. Even if I miss only some details, I ask the authors to revise the paper in order to group by instruments. Now, a description of the instruments (subsections for aircraft and dropsondes) is followed by a section of the quality-processing, again with subsection for the aircraft and dropsondes. Next section is about data quality and statistics with subsections for the aircraft and dropsondes, where the dropsonde subsection has several subsections. I propose to have after the introduction a chapter with sections about the aircraft measurements, their post-processing and data quality and same for the dropsondes. I hope this avoids the frequent turn the pages while reading the article.

Another general point are the very long sentences. Sometimes, several thoughts are within one long sentence. I propose to split the long sentences and have one thought per sentence.

Comments line by line:

- Figure 1, 3rd line: "Squares in (a)-(c)" -> I cannot see any square in the maps.
- Line 125: The accuracy is 2% for the relative humidity. Is it 2% of the current reading or +/-2% for all readings (2% accuracy and 50% relative air humidity can be 50+/-2% or 50+/-1%).
- Line 135: How are outliers defined? How are these corrected?
- Line 137: How was the correction of air pressure data done?
- Line 155: Is it an absolute or relative bias?
- Line 179: "...corresponding error was higher than..." -> How were these errors

calculated?

- Line 183: How were the predefined limits defined? How were outliers defined? How were wild points defined?
- Lines 193/194: "...differed too much..." -> How much is too much?
- Section 4.1: I miss the quality-processing of the wind data.
- Lines 265-268: Why are aircraft measurements in the dropsonde section? Please move it to the aircraft section.
- Figures 6 & 7: Indicate, which distances correspond to sea ice and which to open water.