This is a review of *Winter atmospheric boundary layer observations over sea ice in the coastal zone of the Bothnian Bay (Baltic Sea)* by Wenta et al., submitted to ESSD. The manuscript describes atmospheric boundary layer observations of sea ice in the Bothnian Bay, collected with UAVs over 4 days of 2020 northern hemisphere spring. Overall, the manuscript is well written, concise and the technical details of the flights and measurements are easy to follow. The data was mostly easy to access and consistent with the description in the manuscript. I have some minor comments and suggestions below.

Manuscript:

General comments:

I don't have a feeling for how good NWPs and reanalyses capture the atmospheric boundary layer conditions in this region (or other polar regions with similar characteristics). The authors state that the small-scale processes at the atmosphere-sea ice-ocean interface are crucial for improving NWP models in the polar region. I understand that this dataset can be useful for informing or evaluating NWPs or reanalyses, but has the specific study site been flagged as a particular region of interest in any previous studies, or is it a matter of being a convenient location logistically while also being representative?

I note that no clouds were present below the aircraft during the campaign, but were clouds present above the aircraft during any of the flights? Some of the atmospheric conditions as well as the measurements could be affected by clouds (and vice versa), so this could potentially be useful to indicate (if known).

Minor comments:

Line 37-39. How do the measurements from the HAOS compare to those from the ISOBAR campaign?

Figure 1c. Hailuoto is hard to find on the map and it doesn't appear to be highlighted or distinguished from other labels. If the label could be made bigger or a bounding box around Hailuoto that would be good.

Figure 2. I recommend changing the font of the "open water" to white or a lighter colour since it is too dark to read easily.

Line 94. CMOS isn't defined.

Dataset:

I downloaded the zip file containing all the files from https://doi.pangaea.de/10.1594/PANGAEA.918823. Within that are tab-delimited files containing measurements from the 3d anemometer and the automated weather station from the ground-based measurements, the measurements from both sensors on the UAV, as well as links to download the netcdf files containing the LIDAR data.

Using the R packages readr and tidync, I read in a sample of each different type of measurement to inspect the data and produce some quick plots. I also did a quick comparison of the altitude data from the two UAV sensors during flight 1, which appeared mostly consistent with each other. The files in the zip folder are ".tab" format and are tab delimited, not .csv as described in the manuscript. Aside from this, I had no problems reading the data and everything else appeared consistent with

what was described in the manuscript. Note that for the LIDAR netcdf files, I only checked one of the co-polarisation data files.

I was not able to download the orthomoasic map data. With my logged in Pangea account, I get the following error: "Your client is not allowed to access the requested object. This may because you are logged in with the wrong user account." I created an account on Pangea for the first time to download this dataset, so I'm not sure if it is something to do with Pangaea or the permissions set by the authors of the dataset.