

Review of the manuscript ‘Unmanned aircraft system measurements of the atmospheric boundary layer over Terra Nova Bay, Antarctica’ by S. L. Knuth et al.

Boundary layer observations in Arctic regions are extremely sparse so any data set as the one presented here is highly valuable for atmospheric science. In my opinion the presented measurements are without doubt worth publication, although I mean a careful revision is necessary, taking in particular in account the following aspects:

- 1) I feel the local flights (at least 6 of them will not be of great value for scientific investigations, I therefore suggest to remove figure 5. For the same reason I would erase the right column in Table 1 and use the gained space there for a more detailed description of the scientific flights (e.g. synoptic condition, mean/max wind speed, mean wind direction, mean temperature and number of profiles flown during each mission). That would highly ease the estimation of the different flights for future investigations by potential users.
- 2) Table 4 can be cut out without any loss of information for the manuscript
- 3) Fig 2 is too small in its current version, it should be a full page plot. I also suggest to label the flight altitude by a color code in this figure, giving a better overview of the different flights. A marker for the positioning of profiles performed would also be highly appreciated.
- 4) Fig. 4: the profiles should be labeled with time and position instead of “Profile 1,2 3”
- 5) Page 1038, line1: do I understand right that some of the profiles are measured in upward flight and others in downward? If so, is there a constant climb/descent velocity. If not this would lead to inconsistencies due to the sensor time lag. Could you comment on this.
- 6) Page 1038, line 27: I would like to have more information on this procedure with the help of flight maneuvers, at least a reference describing it is required here.
- 7) Page 1039, line 23: is there a good reason not to log the u and v- components?
- 8) I am a bit confused about the time stamp discussion in section 4.2 (page 1041/1042): “However, there were no common data values between the telemetered and ADC logger data...” Is this correct? Could not the skin surface temperature logged by both systems be used to identify e.g. changes at overflight of land-sea/ice-sea boundaries? Or could a correlation analysis of the time series of e.g. shortwave radiation help to synchronize the data sets?