

## Comment on amt-2020-495

Anonymous Referee #2

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Referee comment on "Characterizing the performance of a POPS miniaturized optical particle counter when operated on a quadcopter drone" by Zixia Liu et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2020-495-RC2>, 2021

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This manuscript investigated the performance of POPS on a drone and compared with aerosol microphysics measurements observed at the surface. This study provides a series of methods to quantify the uncertainties of the PNCs and PSD measured onboard a drone. The results from this study provide a good reference to the community when one wants to use the POPS or similar instruments to access aerosol profiling issues. The manuscript is well written in English and content structure. My comments are listed belows:

- Higher wind speed increased measurement error. The author explained that it is caused by the drone suffers from variations in pitch and yaw. It is not clear to the reviewer. If the wind direction is fixed during the flight, how the drone changes pitch and yaw frequently. My personal opinion is that the inlet flow rate of POPS is small, the high speed of horizontal wind causes the measurement uncertainty due to the insufficient inlet flow.
- In the abstract (line 59), the measurement errors induced from turbulence need to be carefully stated since the authors did not provide turbulence measurement data to support the conclusion.
- Introduction: The first paragraph is too long and can be divided into three paragraphs.
- Line 138: please check latlon format.
- Lines 157-160: not clear to reviewer, rewritten the sentence is needed.
- Line 278: T14 was marked as red in the table.
- Lines 250 and 351. The values from what kind of surface measurements should be specified.
- In Figure 3. The unusual spike values (bad data) may remove from the figure. X-axis label should be improved.
- In Figure 5: The dark blue line can be changed as green.
- Table 5: All flights à all cases. The PNC MAD (%) might merge to the same raw of PNC RMSD(%).
- Table 6 might present in two tables, same as tables 4&5.

