

Atmos. Meas. Tech. Discuss., referee comment RC3
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Comment on amt-2022-185

Anonymous Referee #3

Referee comment on "Characterization of a modified printed optical particle spectrometer for high-frequency and high-precision laboratory and field measurements" by Sabin Kasparoglu et al., Atmos. Meas. Tech. Discuss.,
<https://doi.org/10.5194/amt-2022-185-RC3>, 2022

General comments:

A modified version of Commercial POPS is presented. Authors used a high-precision multichannel analyzer to improve count rate limitation. A needle valve and vacuum pump are used to provide additional flow stability. The overall goal of the manuscript is to characterize the modified POPS instrument along with the comparison with commercial one. Authors also presented a practical application of the modified POPS, which is the detection of phase transition using high-resolution pulse height data. The reviewer finds the manuscript exciting and a good read. Authors have taken care of explaining minute details and nicely present the work. Review recommends publications with the following comments/suggestions:

- Reviewer is interested in knowing the commercial aspects of modified POPS, for example, cost, size, and portability. Can we still use the modified one for field measurement?
- Reviewer would suggest showing a laboratory picture of modified POPS setup/instrument.
- Reviewer thinks section 2 should contain the details of the modified POPS, and sections like 2.1 to 2.4 should be discussed in the result section (3). Additionally, section 2.5 should go in the supplementary material.

Minor comments:

- Reviewer wonders why figures in the manuscript have a faded axis. Also, authors may wish to remove grid lines from figures.

- In figure 4, reviewer thinks it is better to give the plot names instead of indicating the top, bottom, and middle. The inset of figure 7a is not clearly visible to the reviewer, and a box should be added to indicate the ROI.
- L75, reviewer thinks author should write a line about how and why the $50\ \Omega$ terminator reduces the noise. Reviewer understands the use of a preamplifier, but what is the role of a shaping amplifier.
- L75, maybe reviewer misunderstood why high gain is 0-1V and low gain is 0-10V, expecting the reverse.
- L95, what authors mean by critical flow conditions. Is it a predefined flow condition or maximum flow, or optimum flow?
- In figure 1, the definition of HFDMA should be included in the abbreviations.
- L105, from the reader's point of view, a sentence should be added to explain custom DMA. Furthermore, figure 2 should be moved to page 5.
- L115, author compared the results of other bins? If a higher bin number is assumed to give better statistics, 1000 bins would be more appropriate.
- L140, reviewer did not understand the meaning of a high-level overview. Is it a detailed overview?
- L140, reviewer thinks the short form of HFDMA should be introduced earlier. Maybe in figure 1 or in L105.
- L145, Form reader point of view unit should be consistent. Author can use either inches or m.