Q1: General

A1: We suggest in the manuscript the usage of OPC-N3 as a drone device for fog measurements. However, as the main purpose of OPC-N3 is for PM measurements, our goal of this article was to show that OPC-N3 can be used to detect fog particles. This article focuses on the comparison of OPC-N3 with OLV. We have used OPC-N3 for making vertical profiles of fog, however, before it's publication we wanted to make the first article showing that OPC-N3 is possible to detect fog droplets.

Q2: Language and citations

A2: The referee suggested some changes of the sentence structure and additional citations which will be done. Additionally, the text will be sent for language correction.

Q3: Article structure

A3: The referee suggested to change the article structure. The section "Instruments and methods can be divided into two separate sections. The proposition of the referee was to discuss the results as a case of light fog and heavy fog case. The article focuses on the calibration of OPC-N3 in all cases of fog measurements, and the calibration is done with the reference device OLV. During the measurements, only one case which is described in the manuscript, was longer than two hours and allowed for case analysing. Therefore, we would like to maintain the current structure of this paragraph. The conclusions can be rewritten in the form of bullets for better reading.

Q4: Why OPC-N3 measurements wrong? Why OLV is seeing 3 times more Nc than OPC-N3?

A4: OPC-N3 is a cheap optical counter. The manufacturer does not provide clear information about: - processing of the data (how light scattering is changed to the radius of droplets); - how OPC-N3 is built inside; - how is measured, the sampling volume, and how this is affected by the speed of the fan. Without that information, it is hard to determine why OPC-N3 is detecting fewer droplets in comparison with OLV. We have come up with several possible scenarios in which the observations may be underestimated. Processing of the data - for example, assuming one RI for all particles - can lead to wrong droplet assignment to specific radii leading to lowering LWC. The fan speed forces the flow in OPC-N3 and changes in time. Therefore, the data are corrected by the manufacturer to take this effect into account, however there may be some bias which leads to a systematic lowering of the number concentration of droplets. The air is sucked into the OPC-N3 through a narrow inlet, inside we suppose the flow has no special path and expands throughout the whole device. This can affect the concentration of droplets in OPC-N3. Electronics inside OPC-N3 heats the surrounding which can lead to the arise of temperature and lowering humidity (see Section 2.4.2 and Fig. 2) and result in evaporation of droplets.

Q5: Why OVL taken as reference?

A5: OVL is a high quality device which provides particle and droplet sizing measurements in real-time. It was used for droplet characterisation in clouds giving good results. OVL is waterproof, which allows for installation in our rooftop laboratory.

Q6: Why in table 3 the upper limit is different? Why has measurements more than 20 micron? Data available but company did not say?

A6: The manufacturer of OPC-N3 provides information that the upper limit of the last bin is 20 microns. Big droplets of radius 19 microns are rare, however, when the number of droplets is multiplied by its density, it can be seen that the spectrum of mass has an abrupt peak in the last bin of OPC-N3 (Figure 1 upper panel). By consulting with Alphasense, it was obtained information that indeed the last bin can count also bigger droplets, however, as usually OPC-N3 is used for PM calculations and such big aerosols are not often, for PM calculation the assumption of upper limit as 20 micros is sufficient. Therefore, the upper limit of the last bin of OPC-N3 was chosen arbitrary and it can measure droplets higher than 20 microns. That is why in Section 2.4.1 (Scope of compliance between OPC-N3 and ShadowGraph), based on data from ShadowGraph, we estimated that the last bin of OPC-N3 can calculate the droplets up to 25.02 microns.

Q7: Fig. 07: Why OPC-N3 measures more LWC than OLV

A7: The OPC-N3 vDSD is smaller than from OLV. The plots consist of two scales, the scale for OPC-N3 is on the right side - orange, and is in a lower range than the scale for OLV (left, blue scale).