Simulation and Field Campaign Evaluation of an Optical Particle Counter on a Fixed-Wing UAV
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This is a well written and well-presented paper for which the authors should be congratulated. It has tackled head-on the difficult topic of accurate cloud droplet sampling from a moving platform.

Section 3 - Modelling
Modelling the flow regime around the instrument is important to understand how this will bias what is being measured - I applaud the authors for what they have done here.

This section would benefit from addressing not only the flow and pressure regimes but also what effects these may have on the temperature and humidity fields the sample experiences as it passes through the instrument. Droplets\particles\aerosol in the sample will grow and shrink so that they are in equilibrium with the surrounding continuum and to really understand the biases and uncertainties in your measurements you really need to have a handle on this. What is suggested is that the evolution of an example droplet distribution be modelled as it travels through the instrument and compared with the original.

General Instrumentation questions
Please could you address the effect of condensation on instrument surfaces - specifically the inner surfaces but condensation on the outer can also have an effect? For example, unless active precautions are taken then where the sample tube of an instrument sticks out into the airflow the surfaces of the sampler are cooled. In a high humidity environment, like those found in clouds, this can lead to condensation onto the chilled surfaces which can impact optical performance and the humidity field around the sampled droplets - this, in turn, can affect the droplet size distribution.

Determining the temperature and humidity of the environment being sampled and at the point of detection for the droplet\particle\aerosol is a rather important supporting measurement. Droplets\particles\aerosol will grow so that they are in equilibrium with their surroundings - equilibrium with respect to humidity at the surface of a droplet\particle\aerosol is a function of size and composition, temperature and pressure. It is best practice when stating the size of a particle (and hence the concentration) to state the RH conditions - either the measured or after growth to a reference value. It is highly recommended that this is addressed for future use.

Section 4 - Field Campaign Testing and Validation
Profiles were performed through a 4km thick cloud that in lines 255 and 256 is stated as “normally laterally homogeneous within the distance scales discussed in this paper”. Some evidence to back up this statement is needed - some references, please.

The UAS is performing profiles and the data over these profiles compared to a ground-based measurement. There needs to be a more in-depth discussion of what is being assumed here, what variation in cloud properties may be expected in the vertical and these need to be backed up with references to the literature.

The data gathered from both the static and airborne instruments have had data processing performed to come up with concentration and effective droplet diameters. I would expect that there to be some uncertainty associated with these estimates and for this to have been discussed and the range of uncertainty shown in the figures - figures 10 and 11 in particular. In these figures, you are showing the degree to which the measurements agree so showing the uncertainty is essential.

Technical notes

Line 195: Equation 1

Parameter “A” in the equation is not defined in text. All other parameters in this equation are defined in lines 196 - 199

Figures 10 and 11

Concentration units should be cm^{-3}` not cm^3

dn/dlog(Dp) is used in the figure captions and also in the text but dN/dlog(Dp) is used on the figure axis. Need for consistency.