Thank you for your comment. In response, we have conducted an analysis to assess the impact of truncation on the mass-weighted mean diameter (D_m). Our approach follows the CASIM particle size distribution (PSD) framework, where D_m is derived as the ratio of the 4th and 3rd moments. By utilizing the regularized incomplete gamma function, we quantify the truncation effect at D_{cut}, corresponding to the lowest size detected by JWD. The results indicate that while individual moments are affected by truncation, their ratio remains largely unchanged. Since our histograms of D_m already start above 0.5 mm, the bias introduced by truncation is minimal, and hence the shape parameter (μ) remains unaffected or realistic. These findings suggest that discrepancies between JWD and model-derived D_m are negligible due to truncation and the analysis discussed in the manuscript remain valid.

The CASIM particle size distribution definition is

$$N(D) = N\frac{\lambda^{1+\mu}}{\Gamma(1+\mu)}D^{\mu}\exp(-\lambda D) \tag{1}$$

where N is the total number concentration and λ, μ are PSD parameters.

The p-th moment of this distribution is given by

$$M(p) = \frac{N\Gamma(1+\mu+p)}{\lambda^{p}\Gamma(1+\mu)} \tag{2}$$

The mass-weighted mean size is given by the ratio of the 4th and 3rd moments for liquid droplets:

$$D_m = \frac{M(4)}{M(3)} \tag{3}$$

We will use the regularized incomplete upper gamma function (`scipy.special.gammaincc`) from the Python `scipy.stats` library to estimate the moments used to compute the mass-weighted mean diameter D_m, assuming that μ is fixed and the same for both truncated and full distributions.

$$Q(a,x) = \frac{1}{\Gamma(a)}\int_{x}^{\infty} t^{a-1}\exp(-t)\mathrm{d}t \tag{4}$$

such that $Q = 1$ when $x = 0$.

For the CASIM PSD, we define $t = \lambda D$, $a = \mu + 1 + p$ where p is the p-th moment ($p = 0$: number concentration, $p = 3$: mass concentration). The truncation is applied at $x = \lambda D_{\mathrm{cut}}$, where D_{cut} is the lowest size observed by the JWD sensor.

To estimate the ratio of JWD-derived $D_{m,\mathrm{jwd}}$ to CASIM $D_{m,\mathrm{mod}}$:

$$\frac{D_{m,\mathrm{jwd}}}{D_{m,\mathrm{mod}}} = \frac{Q(1+\mu+4, \lambda D_{\mathrm{cut}})}{Q(1+\mu+3, \lambda D_{\mathrm{cut}})} \tag{5}$$

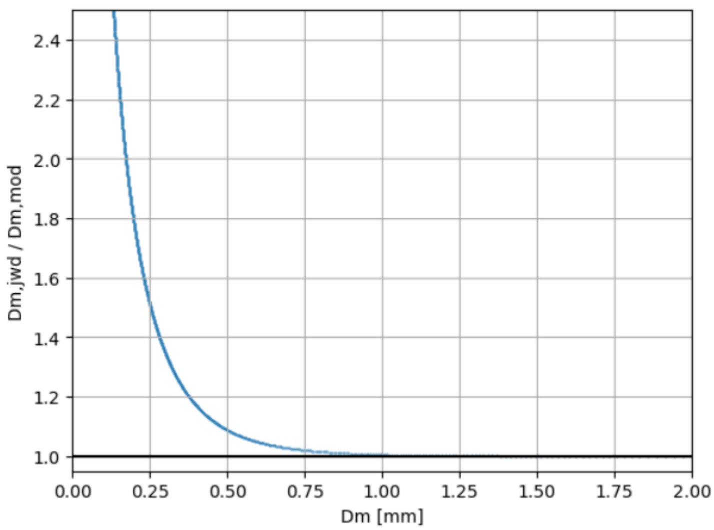

Figure 1: Scatter plot showing the ratio of JWD-derived mass-weighted mean diameter (D_m,jwd) to the CASIM model-derived mass-weighted mean diameter (D_m,mod) as a function of D_m(in mm)

The analysis shows that the effect of truncation on the mass-weighted mean diameter (D_m) is minimal because both the third and fourth moments are truncated at similar rates. As a result, their ratio remains largely unchanged. While truncation significantly affects individual moments, their proportionality ensures that D_m is stable.

Given that the histograms of D_m already start at $D_m \approx 0.5$ mm, this confirms that truncation does not introduce any valid bias. Consequently, since D_m remains unaffected, the shape parameter (μ) is also unlikely to be impacted.

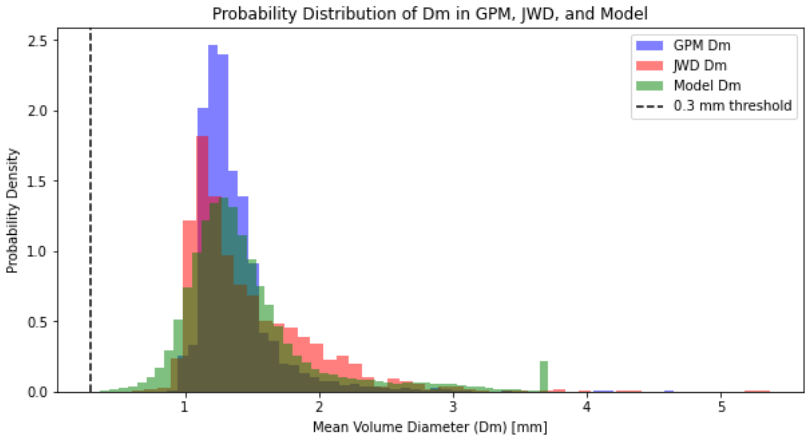

Figure 2: Histogram showing the probability density of drops in D_m size range

Thus, truncation does not concern the validity of the results. Furthermore, because the truncation has less than a 5% effect on $D_m > 0.75$ mm, we can assert that μ should also remain unaffected.