Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., author comment AC3
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Reply on RC3

Jack M. Choczynski et al.

Author comment on "A dual-droplet approach for measuring the hygroscopicity of aqueous aerosol" by Jack M. Choczynski et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-108-AC3, 2021

The intensity we measure arises from light that is reflected and scattered by the droplet. We correct for background intensity, but have found that correcting for the reflection is more difficult. The intensity profile of the LED is narrow with steep rising and falling edges, and this leads to some significant issues when correcting the intensity profile to eliminate the reflection contribution. The simulation reports only the scattered light intensity. Given we arrive at size and RI based on peak position alone, there is some uncertainty (+/- 5 nm in size and ~0.005 in RI). Across this uncertainty range, there is more significant intensity variation than peak position variation. Additionally, the finite resolution of the spectrometer may make sharp peaks appears slightly broader than the simulated couterpart, making the intensity comparison more difficulty. For these reasons, while peak position agreement is good and the overall spectra look comparible, we never expect these data to show perfect agreement. In measurements across a broader wavelength range with a broader illumination spectrum, agreement of both peak positions and overall intensity is more easily achieved (see attached figure for an aqueous NaCl particle).

The arrow in Figure 5B should be located in panel C to indicate that the data in blue corresponds to the RI axis - this will be corrected in the final manuscript. Thank you for spotting this!

Please also note the supplement to this comment:
https://amt.copernicus.org/preprints/amt-2021-108/amt-2021-108-AC3-supplement.pdf