

Interactive comment on “The Importance of Size Ranges in Aerosol Instrument Intercomparisons: A Case Study for the ATom Mission” by Hongyu Guo et al.

Anonymous Referee #1

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General Comments: The manuscript by Guo et al. provided a critical evaluation of the size-related factors impacting aerosol intercomparisons and aerosol quantification during NASA Atmospheric Tomography Mission (ATom), with a focus on the Aerosol Mass Spectrometer. This is an important and necessary piece of work, which can fill the absence of significant unknown biases and the appropriateness of the accuracy estimates for AMS total mass/volume for the mostly aged air masses encountered in ATom. Overall, the paper is well-written. One of the major concerns of this study, however, is the reason for choosing certain bin width, which influences particle size distribution and subsequent comparisons. Before its publication, the following comments need to be addressed.

1.The reason for the choice of bin width (line 337) needs to be elaborated. What is the difference of size distributions in different seasons between using this bin width and using others (narrower or broader width)? The authors need to address such uncertainties in the revised manuscript. 2.The manuscript focused on size-related intercomparisons, but what are the uncertainties in using the same CE for all particle sizes? 3.The PALM+AMP characterize about 54% of V_{phys} , which is much lower than that in ATom-1 and -2, the SAGA filters, MOUDI, AMS (line 689-691). Please elaborate. 4.“*r*” in “*r*²” should be in italics.

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2020-224/amt-2020-224-RC1-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-224, 2020.

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