

Interactive comment on “Modification, Calibration, and Performance of the Ultra-High Sensitivity Aerosol Spectrometer for Particle Size Distribution and Volatility Measurements During the Atmospheric Tomography (ATom) Airborne Campaign” by Agnieszka Kupc et al.

Anonymous Referee #1

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This is a very thorough and well-written manuscript describing the evaluation and performance of the UHSAS instruments deployed during the ATom field campaign. The authors have investigated every aspect of the instrument performance and carefully quantified uncertainties. They have provided detailed descriptions of their methods and experimental details. The instruments performed with close agreement under similar operating conditions. The initial results with one thermodenuded instrument suggested a large fraction of the aerosols were secondary in nature. As this field campaign con-

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tinues, these results should be very enlightening and help to further our understanding and constrain uncertainties regarding the ability of aerosols to act as CCN. My main concern/question is regarding the sensitivity of the instruments to particle refractive index and instrument calibration while operating in the thermodenuded mode. With the exception of sea salt which has a refractive index similar to ammonium sulfate or organic carbon (more volatile fractions), other non-volatile species such as dust or soot have a higher refractive index than was tested as part of the calibration (not to mention effects of complex refractive index). Are the authors concerned about different uncertainties between the thermodenuded and non-thermodenuded instrument when comparing the two measurements? I recommend publication after addressing very minor comments below.

Figure 3: Do the solid lines represent fits to the data? Please note in caption.

Page 18, line 25: I assume the “agreement” values correspond to slopes?

Page 19, line 25: Add “number” before “concentration”

Page 20, line 2: I’m not sure “coarse-mode” is typically used for particles less than 1 μm ?

Page 20, line 7, Figure 11 Caption: typo for “isn” before “the MBL case” and “UT” instead of “FT”.

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