

Atmos. Meas. Tech. Discuss., referee comment RC1  
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## Comment on amt-2022-46

Anonymous Referee #1

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Referee comment on "Retrieval of the Sea Spray Aerosol Mode from Submicron Particle Size Distributions and Supermicron Scattering during LASIC" by Jeramy L. Dedrick et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-46-RC1>, 2022

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The paper presents a method of using the combination of submicron number size distribution and supermicron 3-wavelength nephelometer measurements to derive sea spray aerosol modal parameters. The measurements were made on Ascension Island with the analysis restricted to periods of clean marine conditions. Retrieved sea spray modal mass parameters (diameter, width, mass concentration) are compared to sea spray tracers (supermicron scattering, wind speed, and chloride) to assess the success of the method. It is found that the use of supermicron scattering improves the ability to derive sea spray modal properties above the use of only the submicron number size distribution. The paper is well-written and provides a way to retrieve sea spray mass size distribution properties when only a portion of the submicron number size distribution has been measured.

The most robust test of the method uses comparisons to measured supermicron size distributions from NAAMES 1. As such, Section Text S2, Figure S6, and Table S1 should be included in the main text and not relegated to the supplement material.

Lines 226 – 227: It is stated here that CN3 concentrations less than 600 were used to define clean marine periods. In the abstract, it is stated that particle concentrations less than 400 were considered typical of the clean marine boundary layer. Please clarify.

Lines 345 – 346: Is the statement that “the often strongly correlated relationship between supermicron scattering and sea spray mass” based on the results shown in Figure S1a or previously reported results? If the latter, please provide references.

Lines 417 – 419: It appears that there is a word or two missing from this sentence. No observations during this period were used? Or no observations were eliminated?

Lines 518 – 522: Please provide references for the laboratory, flume, and field observations that are compared to in these statements.

Line 583: change to “incorporation of nephelometer scattering as a constraint for supermicron particle size provides a reasonable”