Supplementary Online Material for "Linking variations in sea spray aerosol particle hygroscopicity to composition during two microcosm experiments"

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The supplementary material consists of six figures that provide additional support for the conclusions presented in the paper.

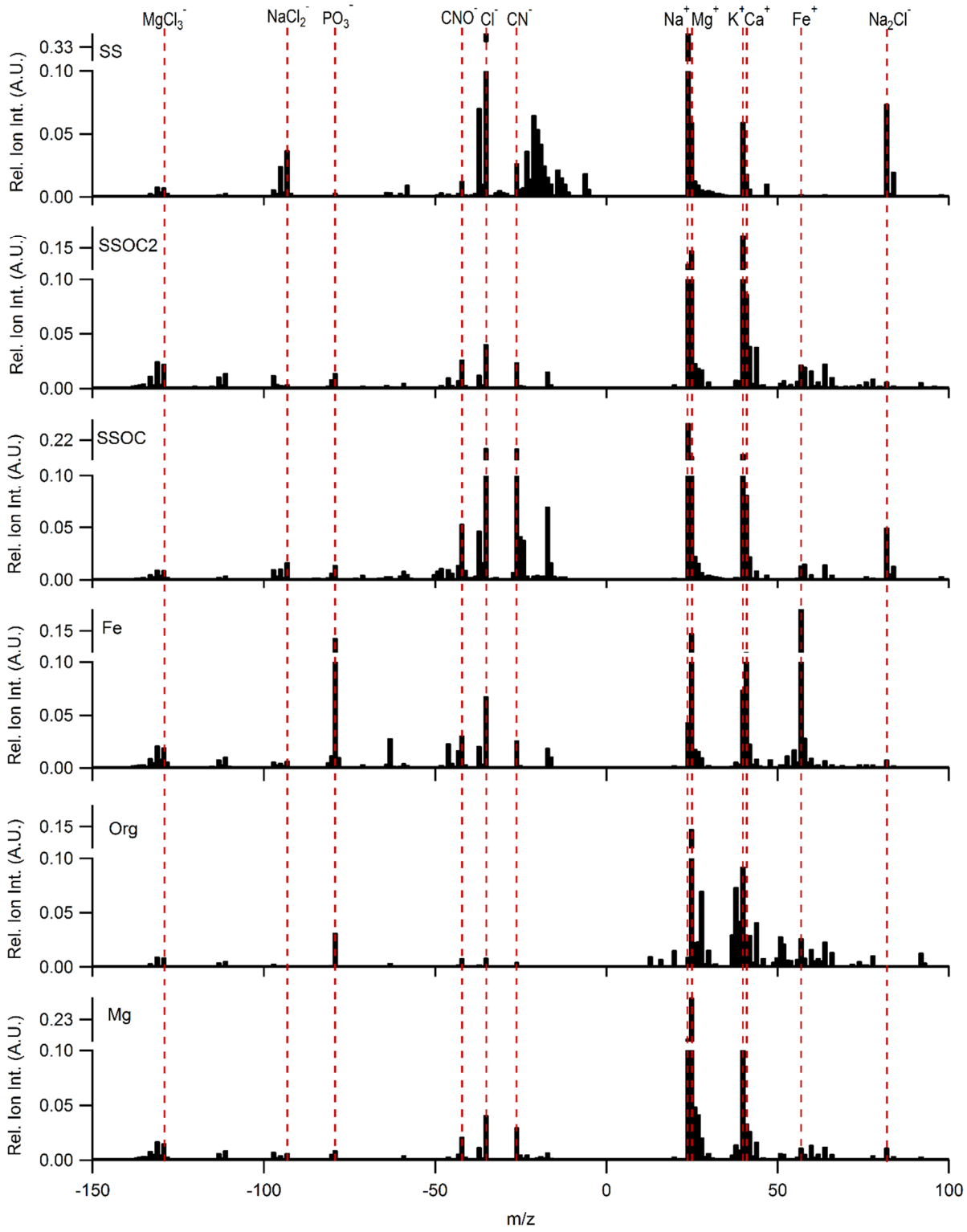

Figure S1. Dual polarity ATOFMS Mass Spectra for the major cluster types: sea salt (SS), sea salt with organic carbon (SSOC and SSOC2), Iron (Fe), Organic (Org), and Magnesium (Mg) clusters.

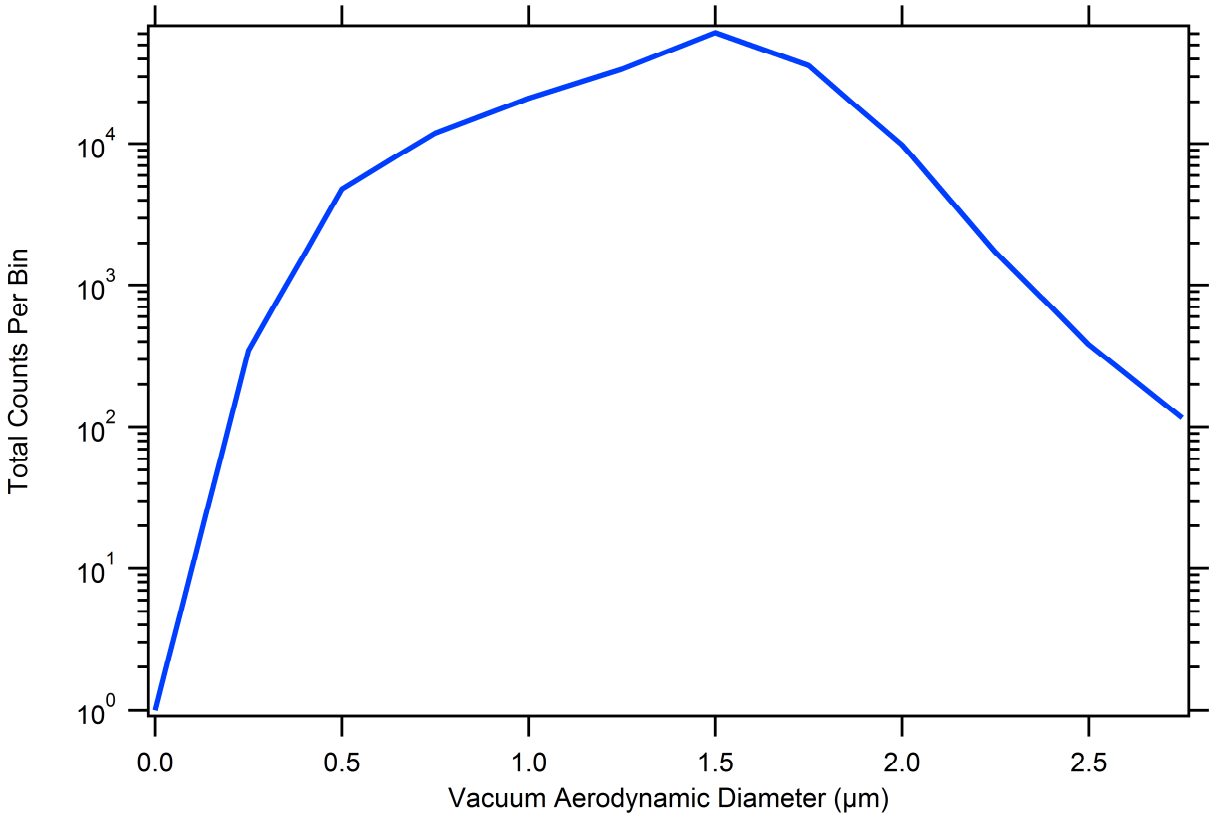

Figure S2. Size-resolved ATOFMS particle counts.

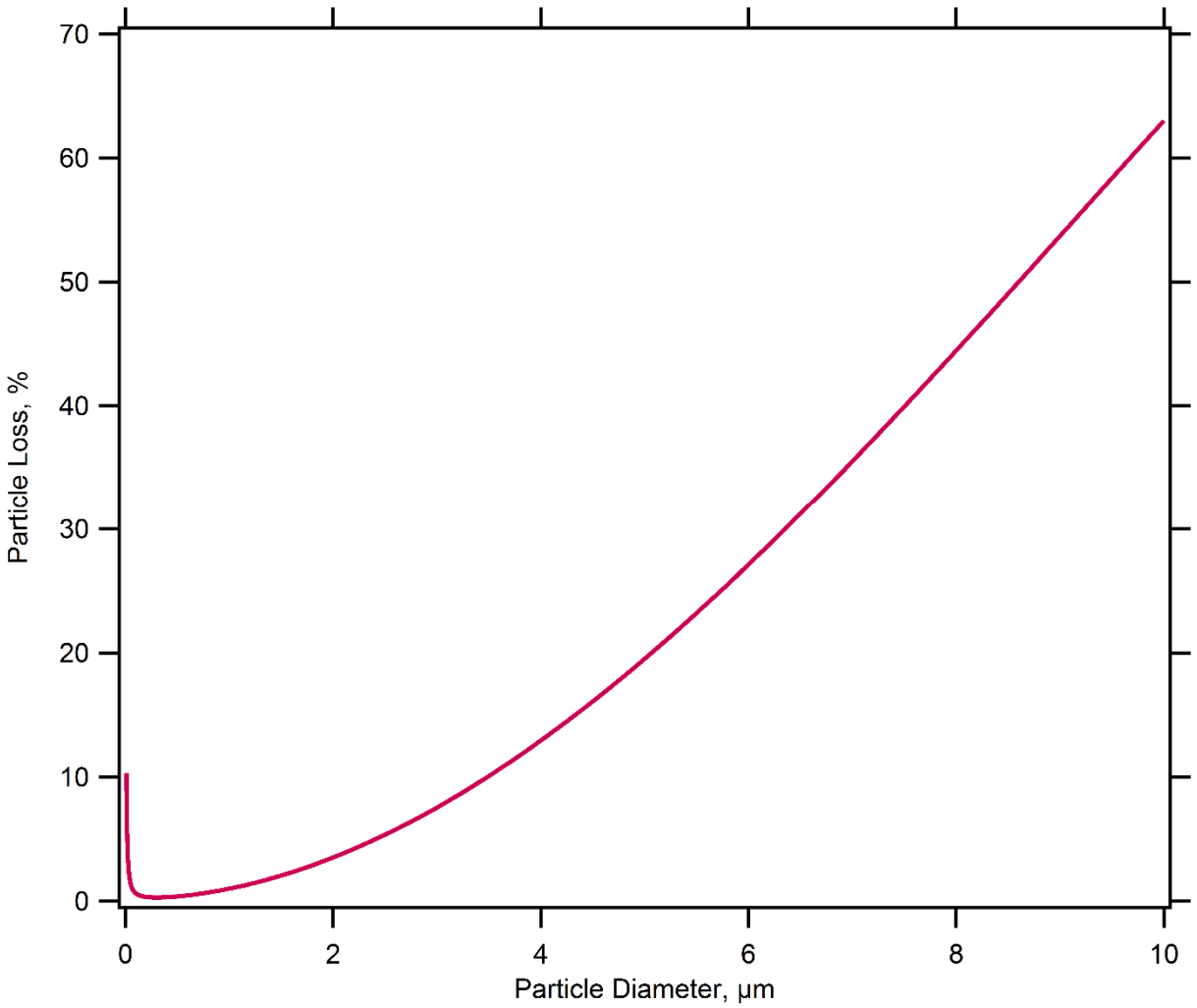

Figure S3. Predicted particle losses for particles travelling from the MART outlet to the MART manifold for a sampling line 10' in length and 3/8" in diameter. The Particle Loss Calculator of [*Von der Weiden et al.*, 2009] as used.

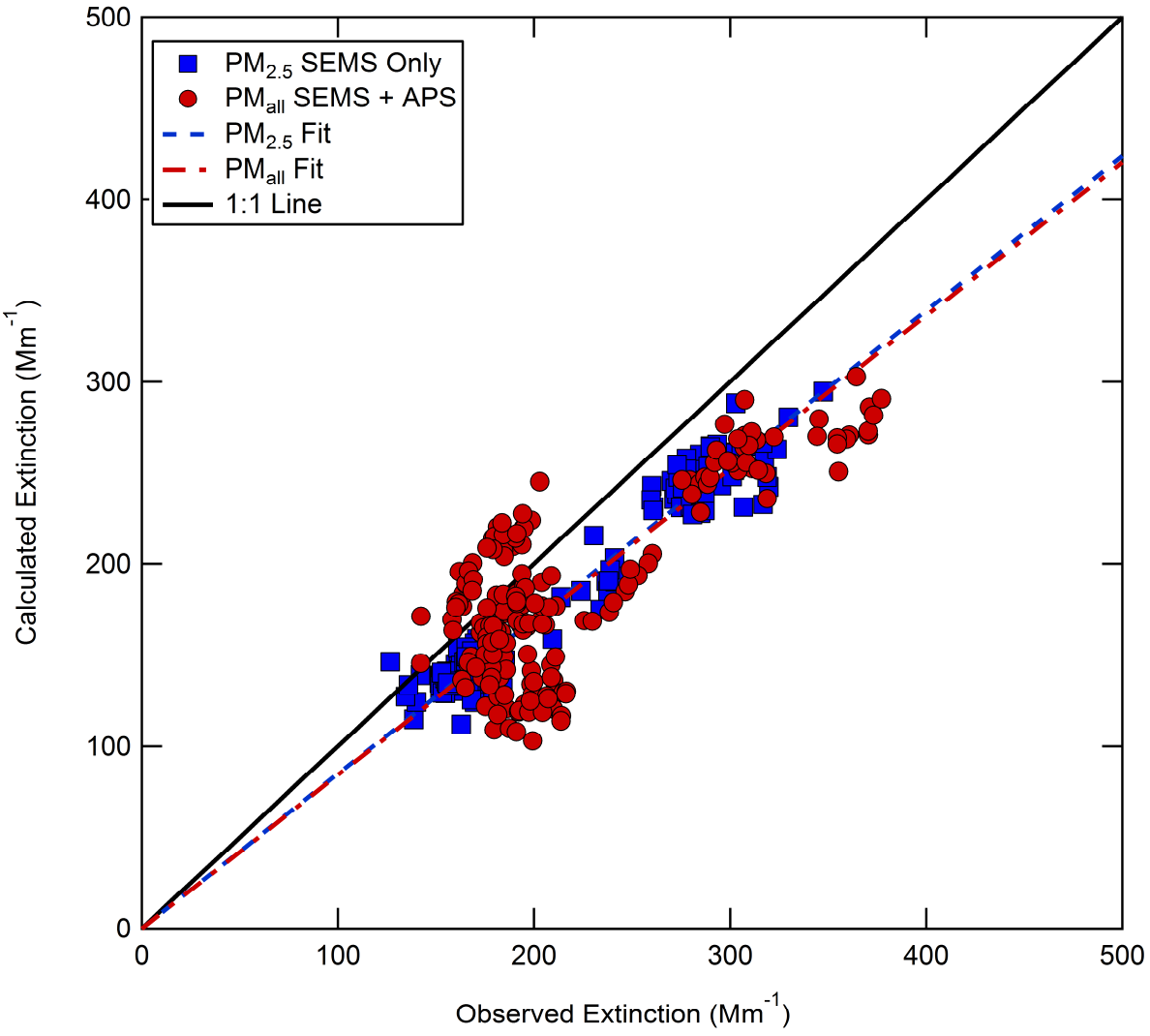

Figure S4. Calculated extinction using SEMS size distributions (real RI = 1.55) for $PM_{2.5}$ and SEMS+APS size distributions as a function of the observed CRD extinction for the 2014 MART experiments. Slopes for linear fits (with the intercept fixed at 0) of calculated extinction as a function of observed extinction were 0.85 and 0.84 for $PM_{2.5}$ and PM_{all}, respectively. A 1:1 line is provided for reference.

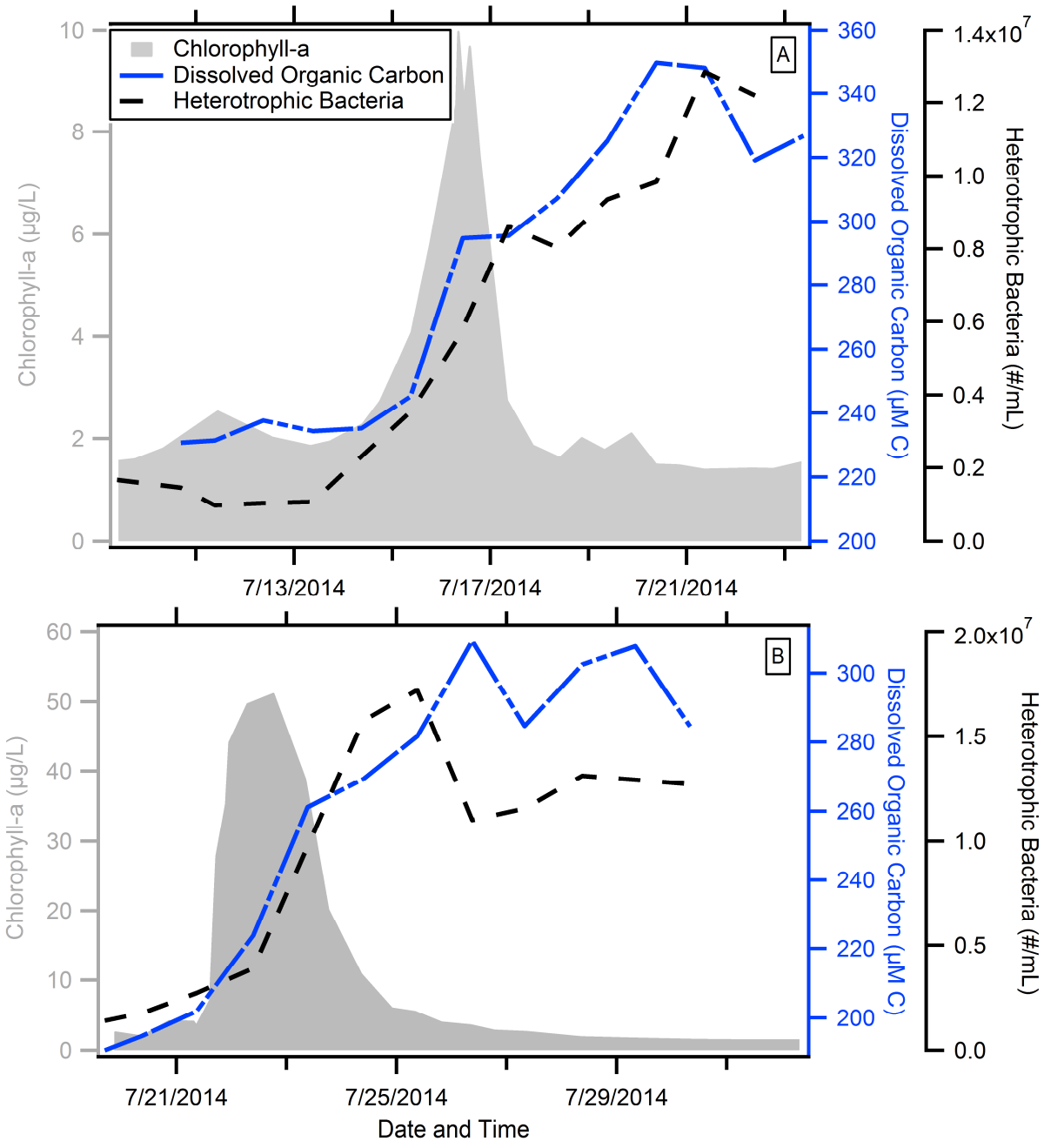

Figure S5. Time series of concentrations of dissolved organic carbon (DOC; µM C), heterotrophic bacteria (#/mL), and chlorophyll-a concentrations (µg/L) in the seawater water for the (A) indoor and (B) outdoor MARTs.

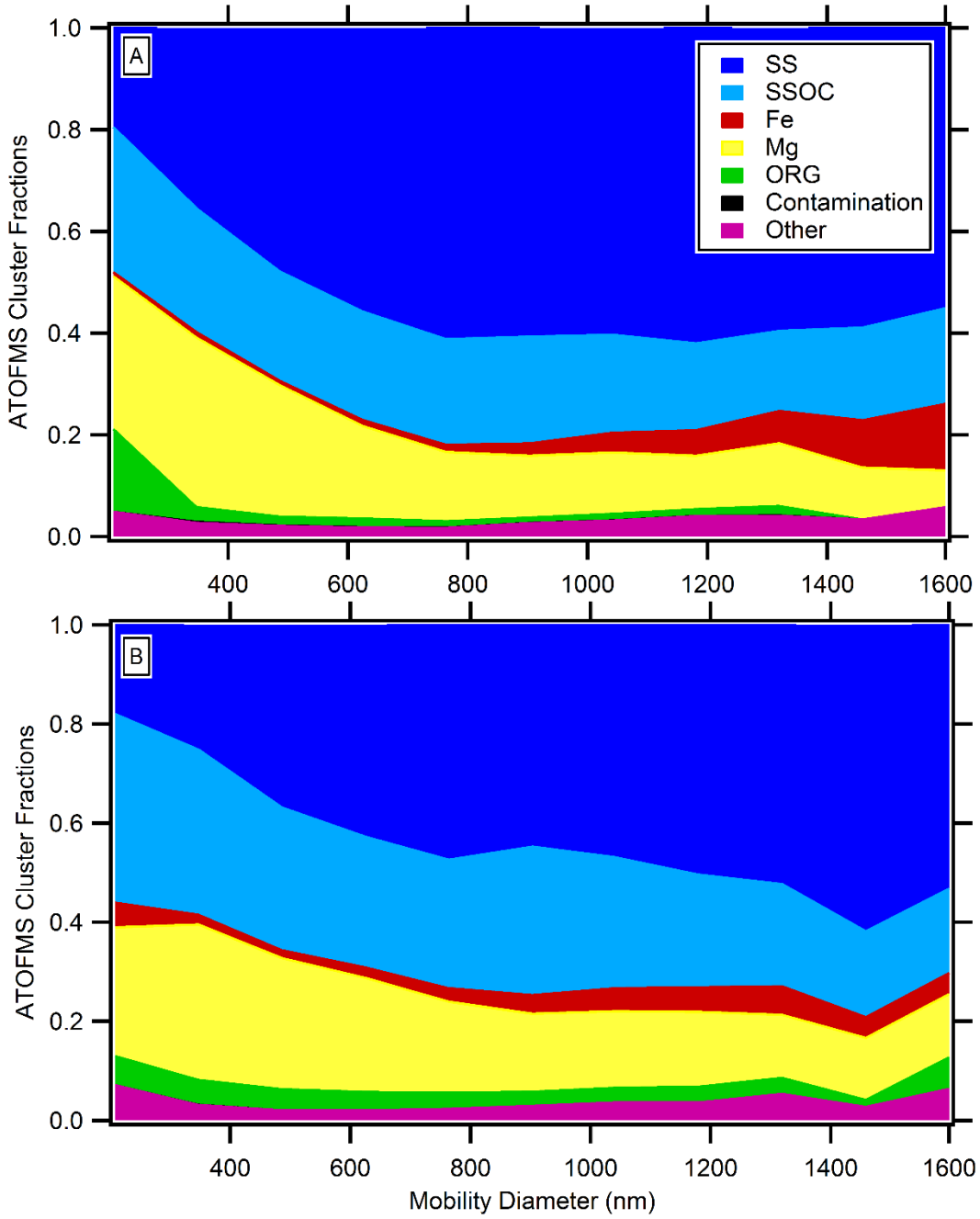

Figure S6. ATOFMS cluster fractions of sea salt (SS; dark blue), sea salt with organic carbon (SSOC; light blue), magnesium type (Mg; light yellow), iron type (Fe; red), organic (ORG; green), contamination (black), and "other" (magenta) as a function of mobility diameter averaged for (A) MART A and (B) MART B. Note the enrichment in non-SS cluster fractions at mobility diameters < 1 µm. Vacuum aerodynamic diameters have been adjusted to mobility diameters assuming spherical particles with a density of 1.8 g cm^{-3}. Vacuum aerodynamic diameter ($d_{p,a}$) was converted to mobility diameter ($d_{p,m}$) using the equation $d_{p,m} = d_{p,a}/1.8$ [*DeCarlo et al.*, 2004].

DeCarlo, P. F., J. G. Slowik, D. R. Worsnop, P. Davidovits, and J. L. Jimenez (2004), Particle morphology and density characterization by combined mobility and aerodynamic diameter measurements. Part 1: Theory, *Aerosol Science and Technology*, *38*(12), 1185-1205.

Von der Weiden, S., F. Drewnick, and S. Borrmann (2009), Particle Loss Calculator–a new software tool for the assessment of the performance of aerosol inlet systems, *Atmos. Meas. Tech*, *2*(2), 479-494.