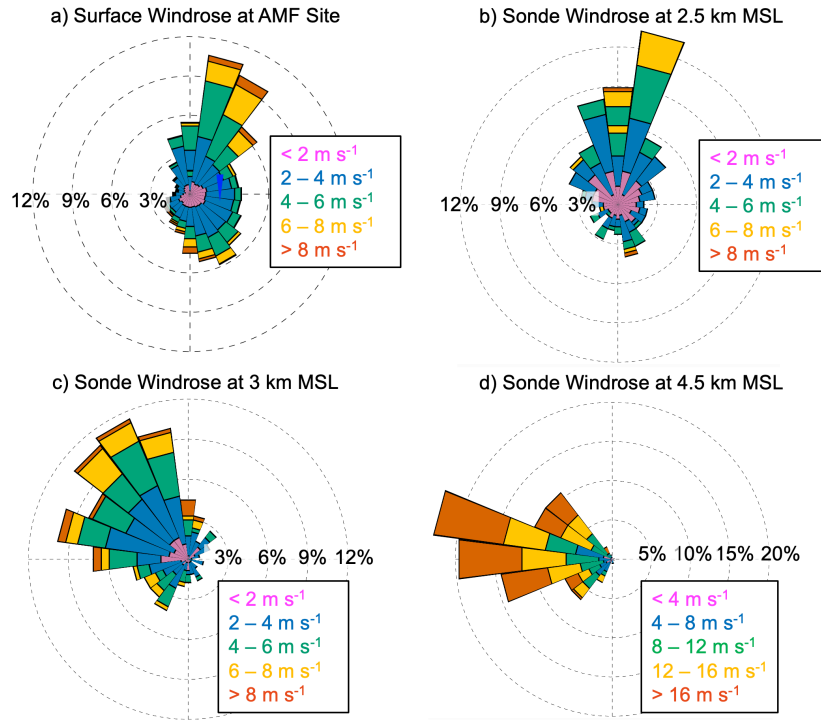Atmospheric
Chemistry
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Supplement of

Large spatiotemporal variability in aerosol properties over central Argentina during the CACTI field campaign
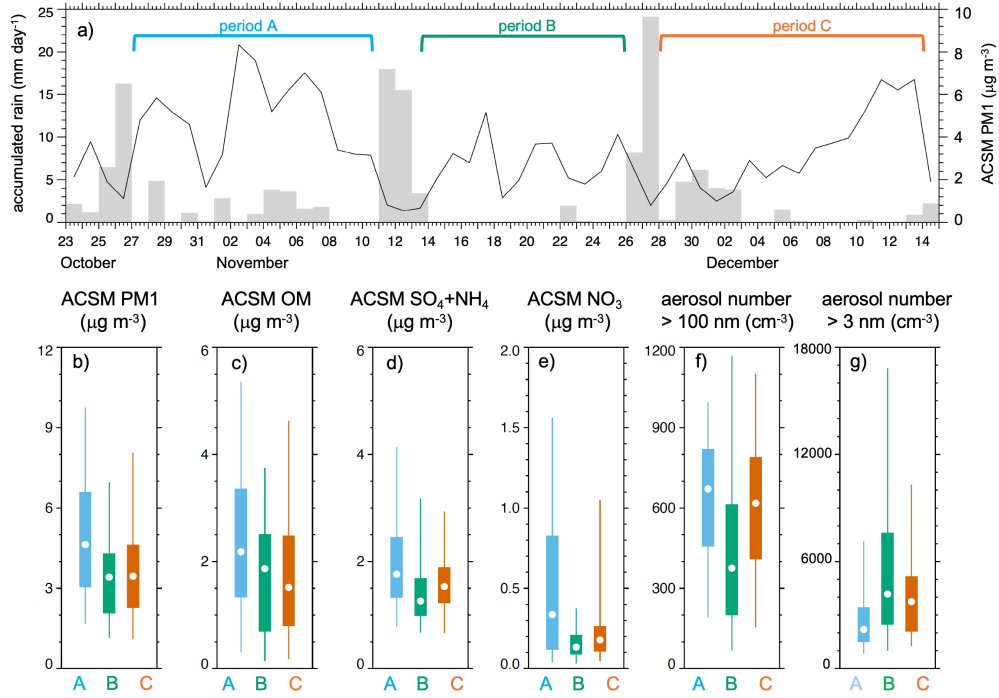
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a) Surface Windrose at AMF Site

b) Sonde Windrose at 2.5 km MSL

c) Sonde Windrose at 3 km MSL

d) Sonde Windrose at 4.5 km MSL

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Figure S1.   Wind roses based on a) surface measurements and radiosonde measurements at b) 2.5, c) 3.0, and d) 4.5 km MSL between October 23 and December 15.
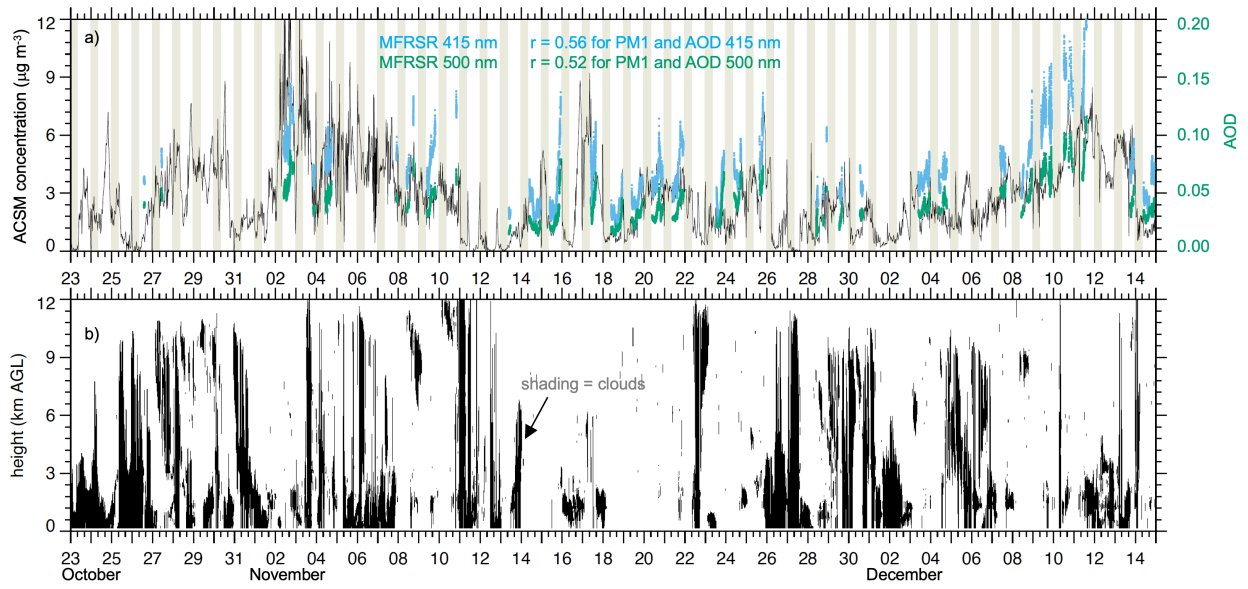
Figure S2. a) Daily averages of ACSM PM1 concentrations and accumulated rain from the optical rain gauge instrument between October 23 and December 15 that define periods A, B, and C, along with percentiles of b) PM1, c) OM, d) SO_4+NH_4, e) NO_3, f) aerosol number > 100 nm and g) aerosol number > 3 nm during periods A, B, and C.
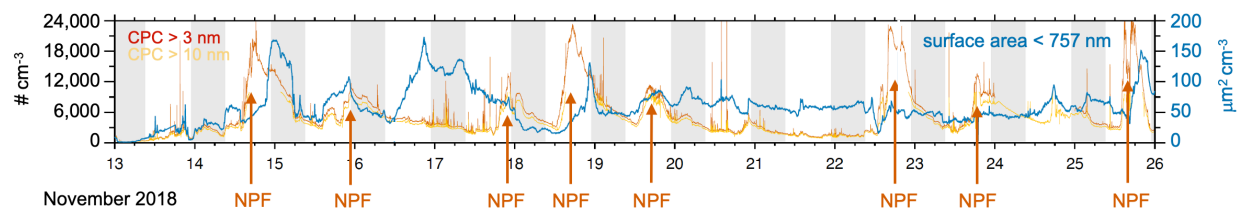
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Figure S3. Time series of a) ACSM PM1 concentration and AOD at 415 and 500 nm and b) vertical distribution of clouds from KAZR-ARSCL. Color bar at the top of b) denotes radiosonde wind directions at ~2 km MSL.
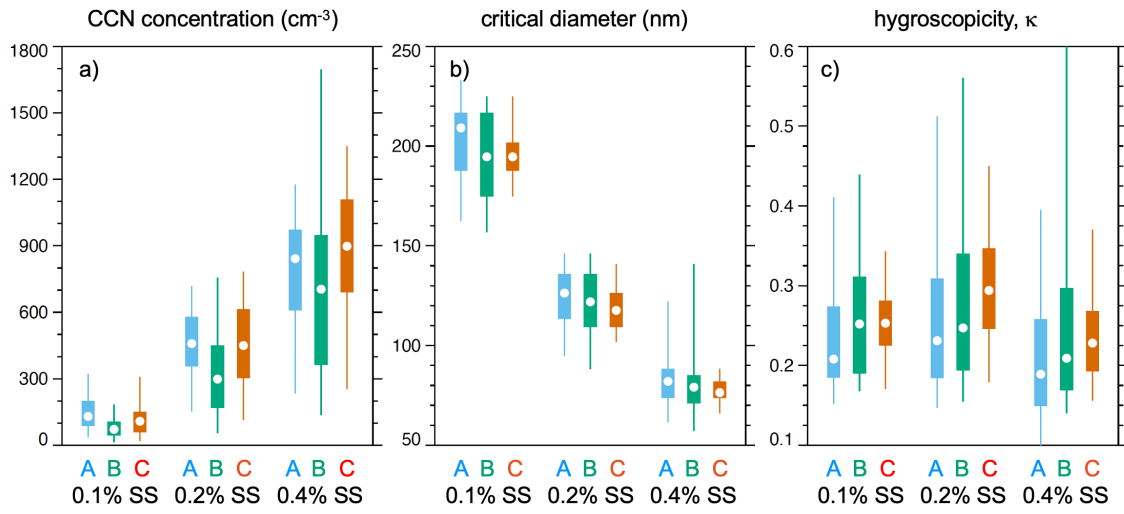
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Figure S4.   Total particle concentrations and surface area for particles with diameters < 757 nm during period B that has several NPF events.
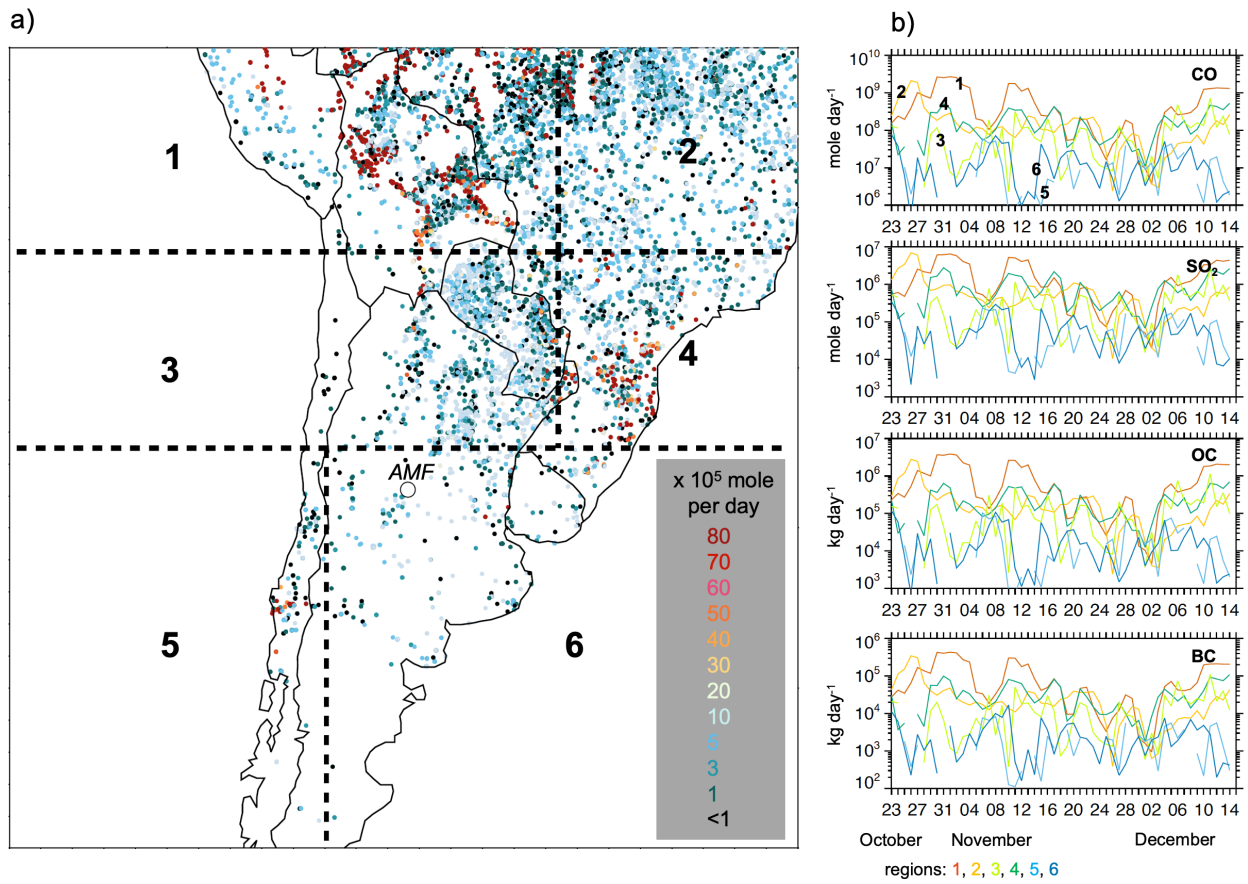
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Figure S5. Percentiles of a) CCN concentration, b) critical diameter, and c) hygroscopicity during periods A, B, and C for 0.1, 0.2 and 0.4% supersaturations.
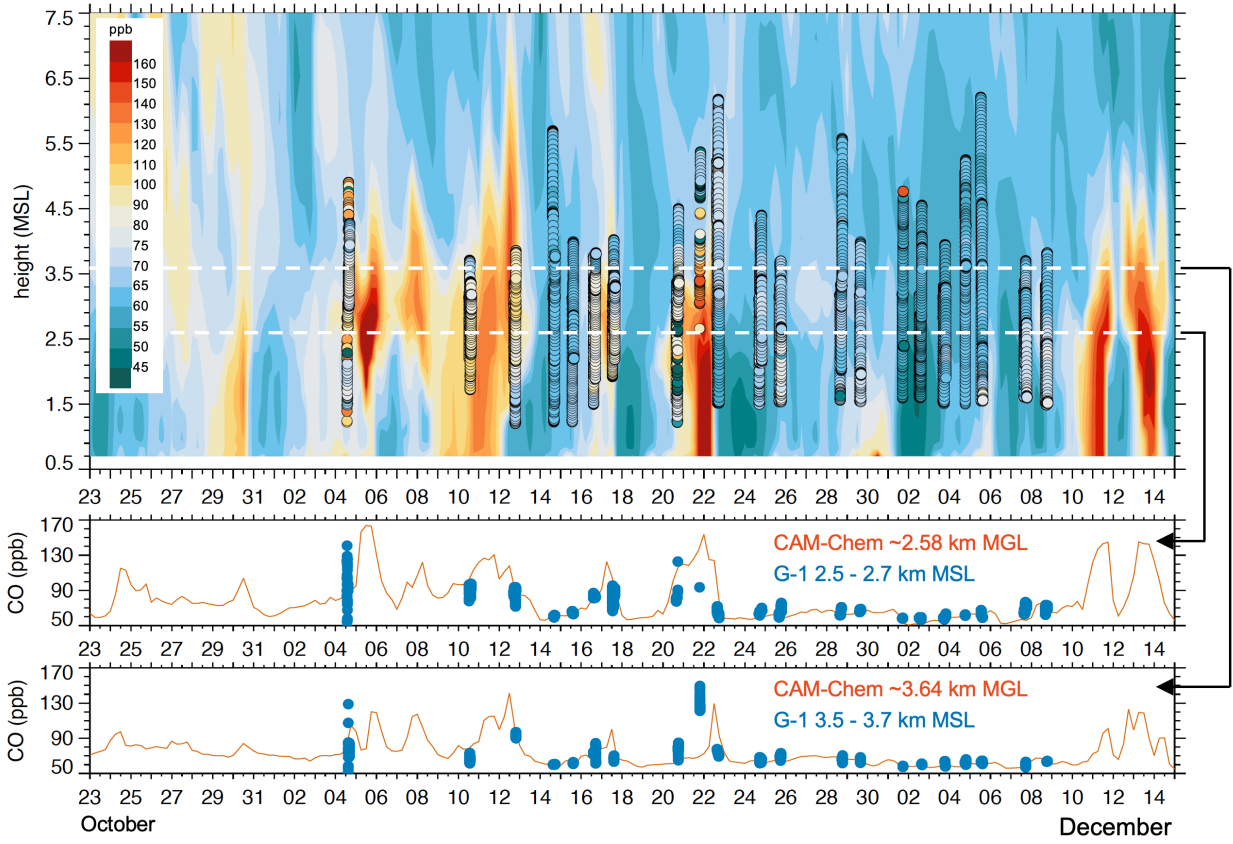
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Figure S6. a) FINN emissions of CO from individual fires between October 23 and December 15 over South America and b) daily variation in total CO, SO₂, OC, and BC emissions (right panels) defined by the six regions over South America.
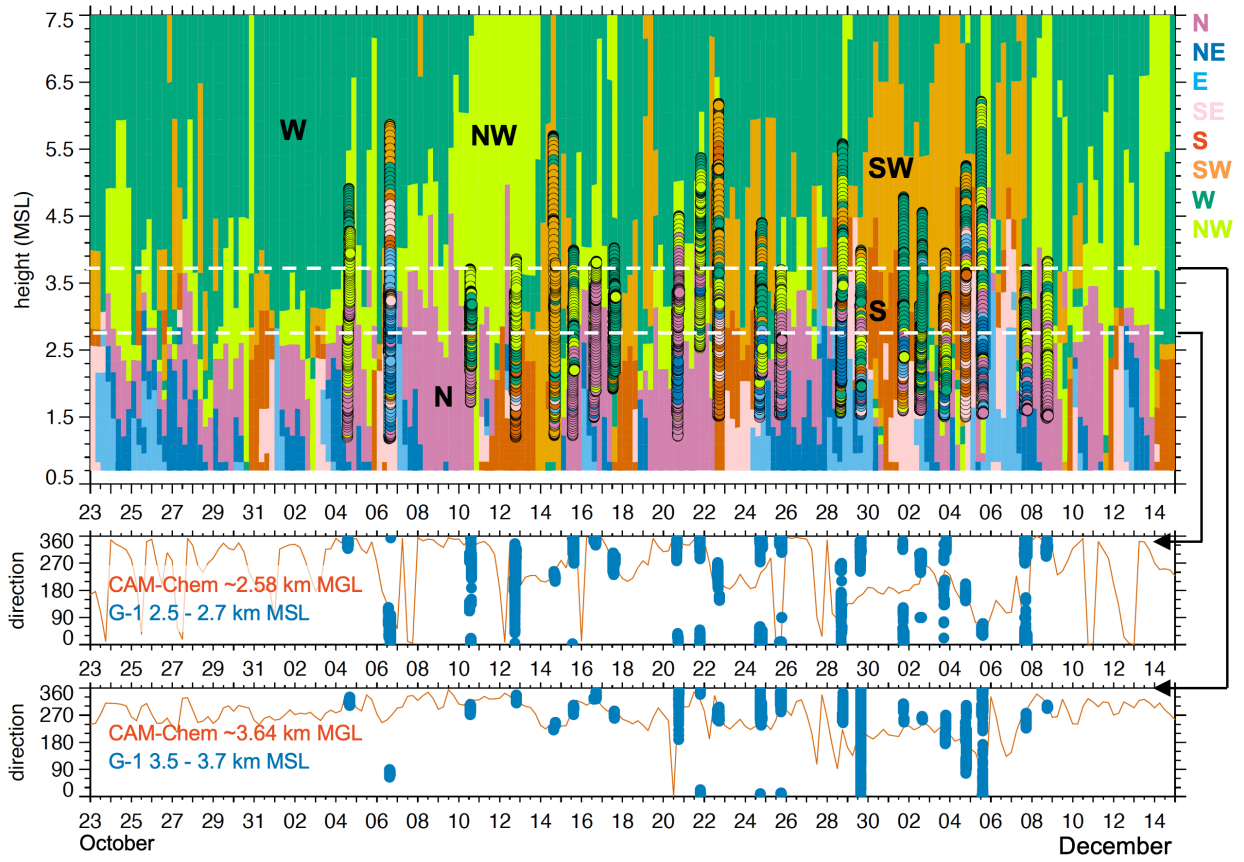
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Figure S7. Temporal variation of CAM-Chem simulated CO profiles over the AMF site along with aircraft measurements (dots). Lower two panels depict time series of observed (blue dots) and simulated (red line) CO at ~2.58 and ~3.64 km MSL.
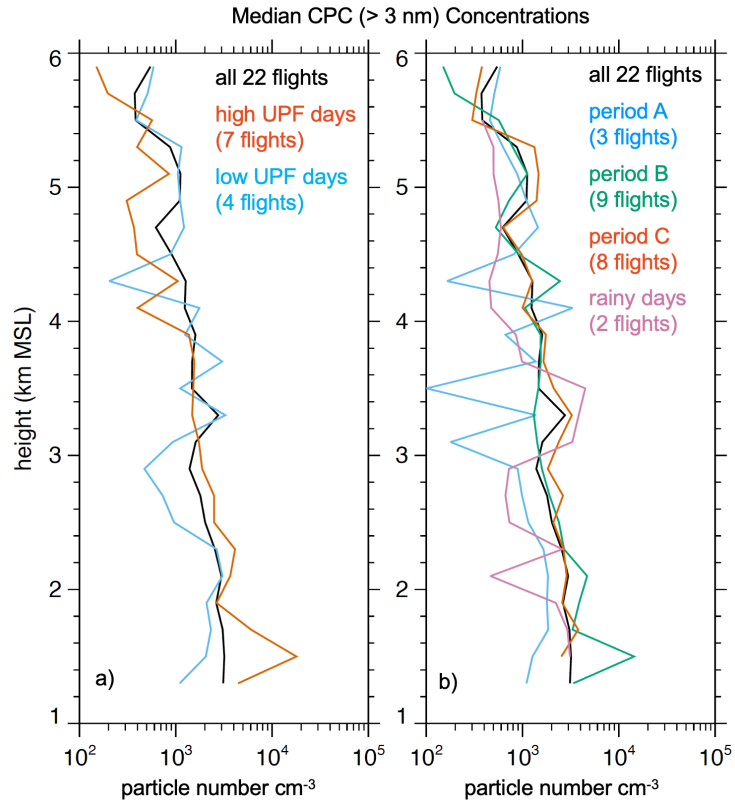
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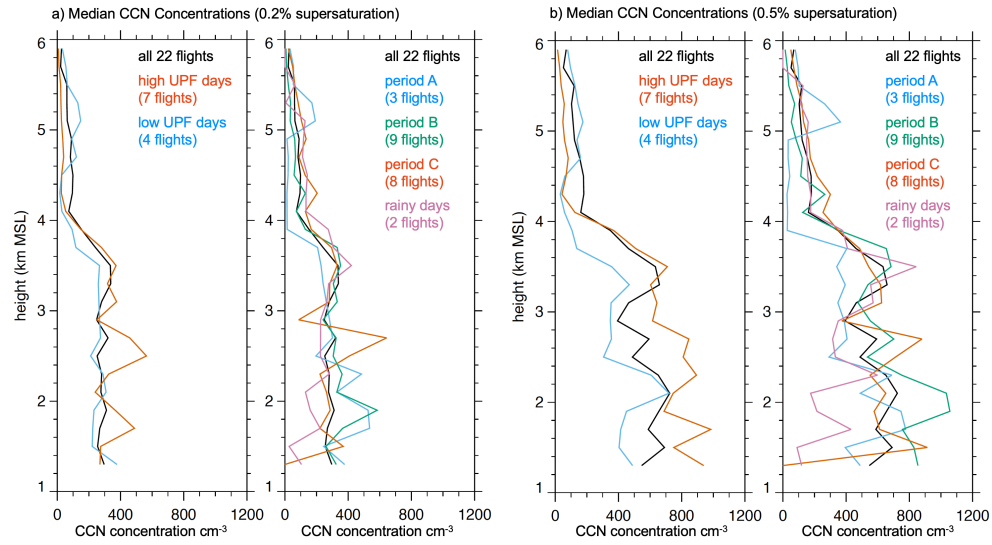40

Figure S8.   Same as Fig. S7, except for wind direction.

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Median CPC (> 3 nm) Concentrations

Figure S9. Profiles of median particle number concentrations (> 3 nm) for all aircraft flights and flights divided into a) low and high UPF days and b) periods A, B, and C.
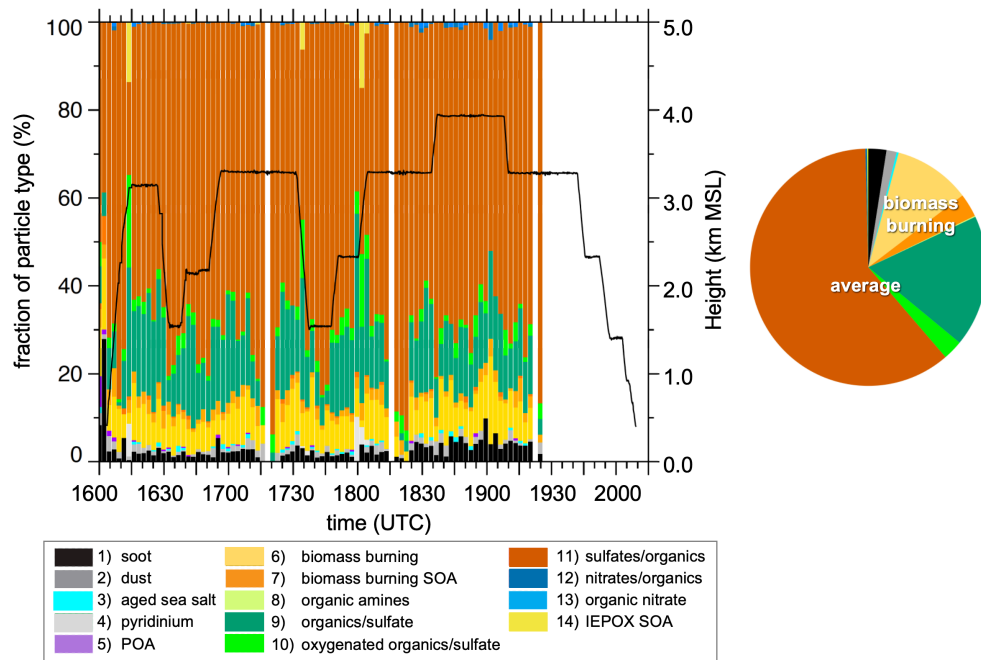
a) Median CCN Concentrations (0.2% supersaturation)

b) Median CCN Concentrations (0.5% supersaturation)

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48   Figure S10. Same as Fig. S5, except for CCN concentrations at a) 0.2% and b) 0.5% supersaturations.

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Figure S11. Particle classes derived from the aircraft miniSPLAT mixing state measurements on December 3.