Supplemental Information

Figure S1: Comparison of aerosol hygroscopicity from both UHSAS and CCN measurements (κ_{CCN}) and AMS bulk chemical composition (κ_{AMS}).

Figure S2: Predicted droplet number (N_d; cm^{-3}) versus measured N_d (cm^{-3}) for all flights used in this work for which w^* was available (Table 1). Error bars in the N_d reflect the range of observed N_d, while the predicted N_d variability corresponds to one standard variation of the observed size distribution during each flight – when propagated through the droplet parameterization.

Figure S3: Predicted droplet number (N_d; cm^{-3}) plotted against measured aerosol number (N_a; cm^{-3}) for the entire flight of RF03. N_d levels off above $N_a \approx 1000$ cm^{-3}, which is where we derive N_d^{lim}.

Figure S4: Predicted maximum supersaturation (%) as a function droplet number (N_d; cm^{-3}) plotted against measured aerosol number (N_a; cm^{-3}) for all flights used in this work.

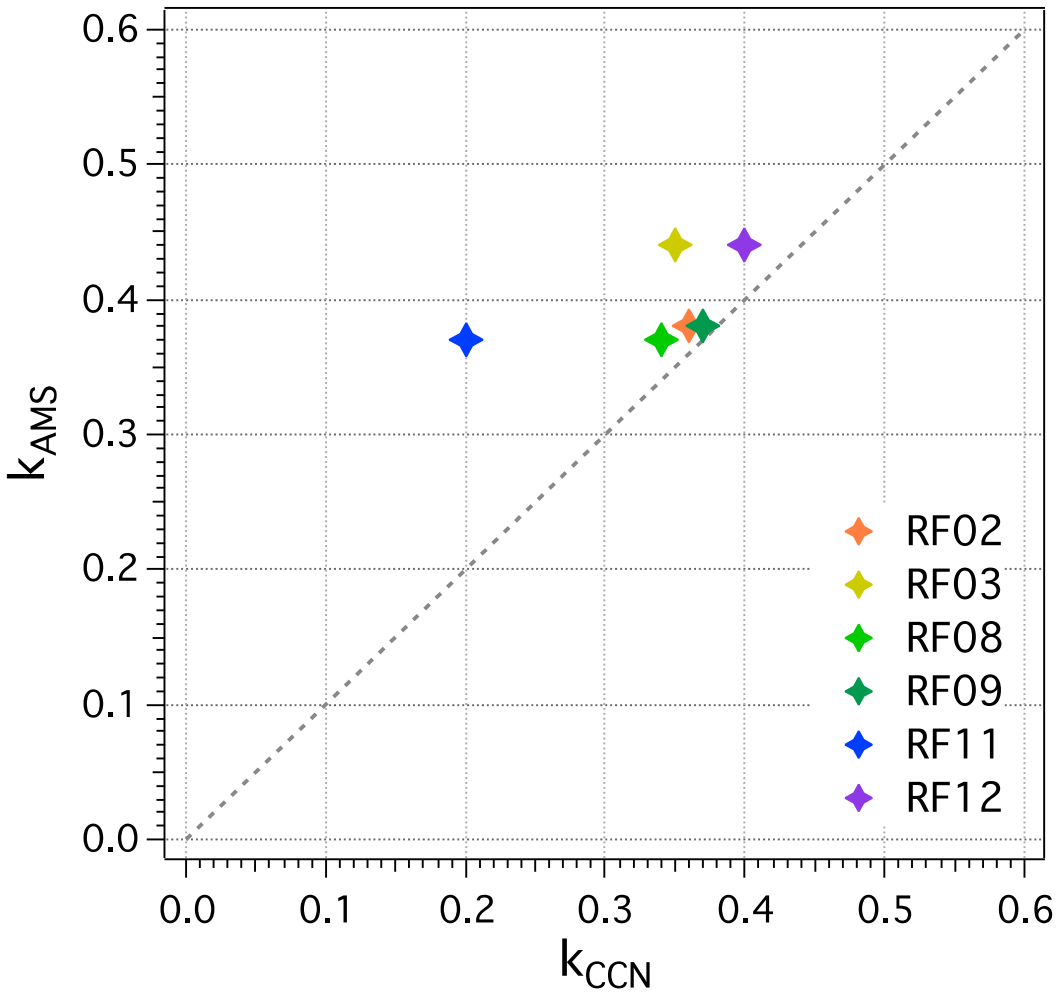
0.6
0.5
0.4
0.3
0.2
0.1
0.0
k_{AMS}
0.0
0.1
0.2
0.3
0.4
0.5
0.6
k_{CCN}
RF02
RF03
RF08
RF09
RF11
RF12

Figure S1

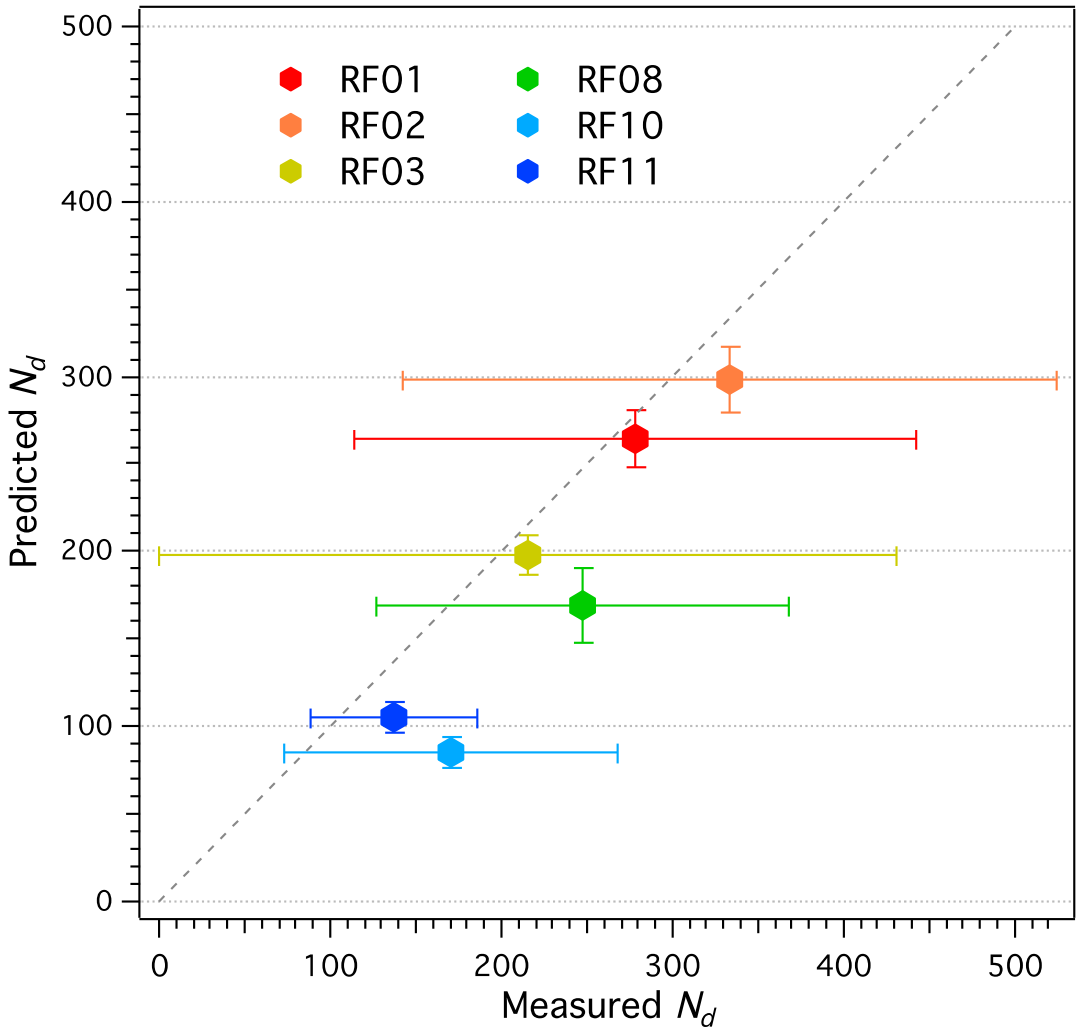
RF01
RF02
RF03
RF08
RF10
RF11
Predicted N_d
Measured N_d
0
100
200
300
400
500

Figure S2

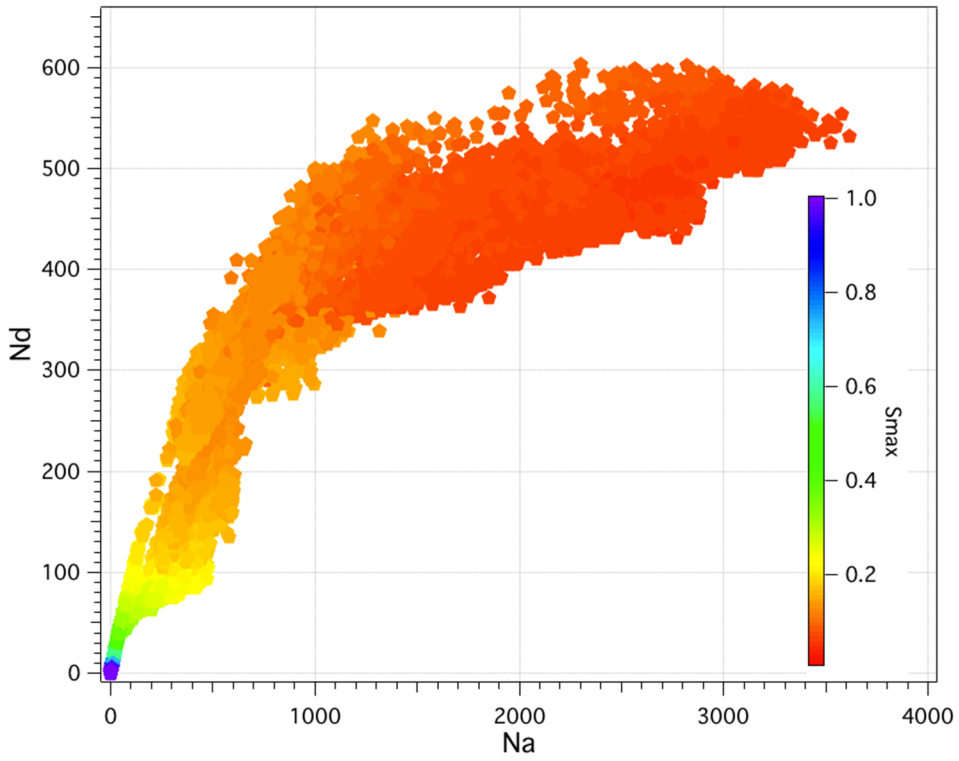
Nd
Na
Smax
0
100
200
300
400
500
600
0
1000
2000
3000
4000
1.0
0.8
0.6
0.4
0.2

Figure S3

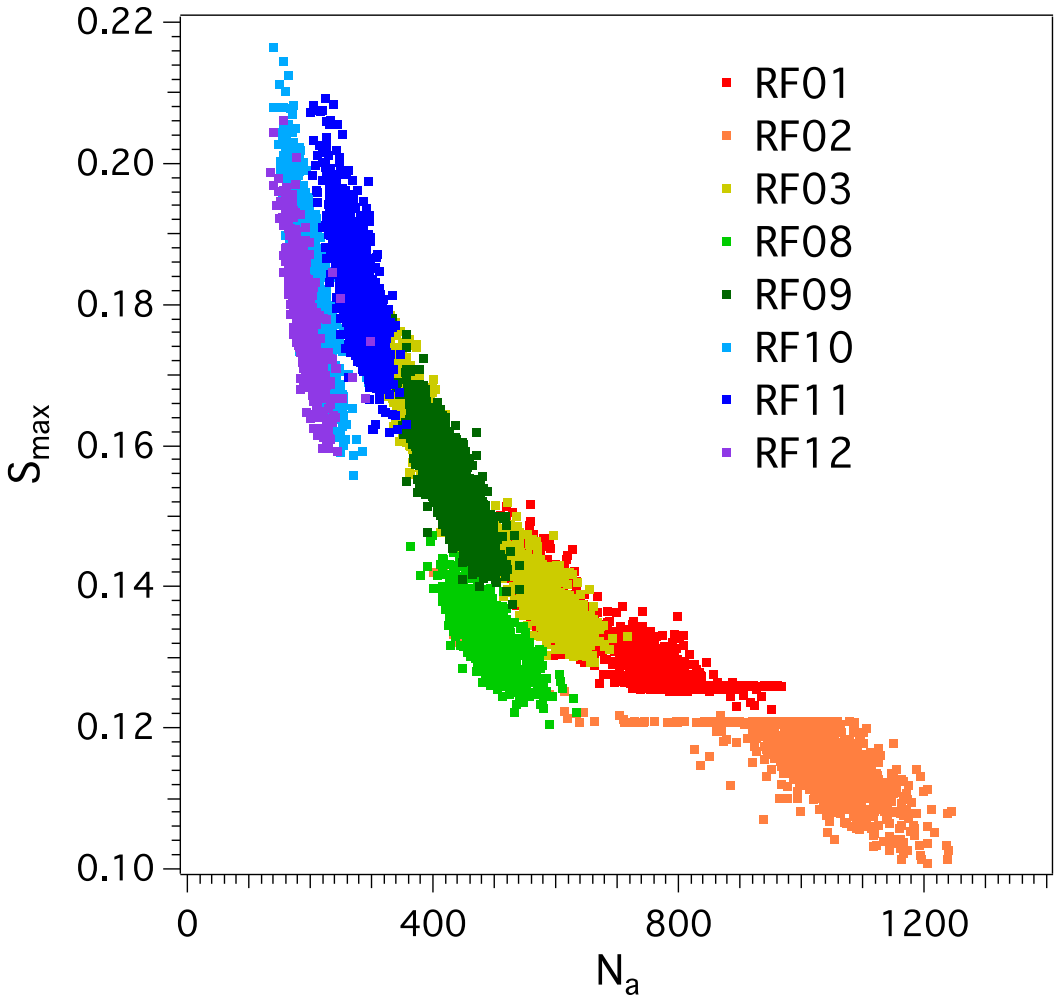
0.22
0.20
0.18
0.16
0.14
0.12
0.10
S_{max}
0
400
800
1200
N_a
RF01
RF02
RF03
RF08
RF09
RF10
RF11
RF12

Figure S4