



Supplement of

Primary and secondary ice production: interactions and their relative importance

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Figure S1. Temporal evolution of (a) LWP and (b) IWP from remote sensing retrievals (symbols) and D15, D15_SIP, B53, and B53_SIP experiments. Gray lines represent the standard deviation for retrievals data points. The light orange shadings show the multilayer stratus and transition period; light blue shadings show the single-layer stratus and frontal clouds periods.



Figure S2. Vertical profiles of LWC (left) and IWC (right) during the single-layer mixedphased cloud period (October 9-12) from the D15, D15_SIP, B53, and B53_SIP experiments; and from remote sensing retrievals (symbols). Gray lines represent the standard deviation for retrievals data points, colored shadings are standard deviations of simulated data.



Figure S3. Same as Figure 3a and Figure 4a, but a correction factor of 1/2 is applied to the measured ice crystal number concentrations for Figure 3a (left) and Figure 4a (right).



Figure S4. Bivariate joint probability density functions (PDF) of (a)-(e) ice crystal number concentration (L^{-1}); and (f)-(j) enhancement ratios of ice crystal number concentration from the respective SIP experiment to that from the ice nucleation experiment without SIP as a function of temperature. A logarithmic scale is used for x-axis.



Figure S5. Vertical profiles of (a) primary ice production rate, (b) secondary ice production rate, and (c) primary plus secondary ice production rate averaged over the single-layer mixed-phase cloud period from the D15, D15_SIP, N12, N12_SIP, B53, and B53_SIP experiments.



Figure S6. Vertical profiles of (a) primary ice production rate, (b) secondary ice production rate, and (c) primary plus secondary ice production rate averaged over the whole M-PACE campaign period from the CNT, CNT_SIP, M92, and M92_SIP experiments.



Figure S7. Vertical profiles of (a) primary ice production rate, (b) secondary ice production rate, and (c) primary plus secondary ice production rate averaged over the whole M-PACE campaign period from the D15, D15_SIP, N12, N12_SIP, B53, and B53_SIP experiments.



Figure S8. Vertical profiles of differences of (a) cloud droplet number concentration, (b) ice production rate from immersion freezing of cloud droplets, (c) immersion freezing INP number concentration, (d) interstitial dust number concentration in the coarse mode, and (e) wet deposition rate of interstitial coarse mode dust between the N12_SIP and N12 experiments.