



Supplement of

Microphysical processes producing high ice water contents (HIWCs) in tropical convective clouds during the HAIC-HIWC field campaign: dominant role of secondary ice production

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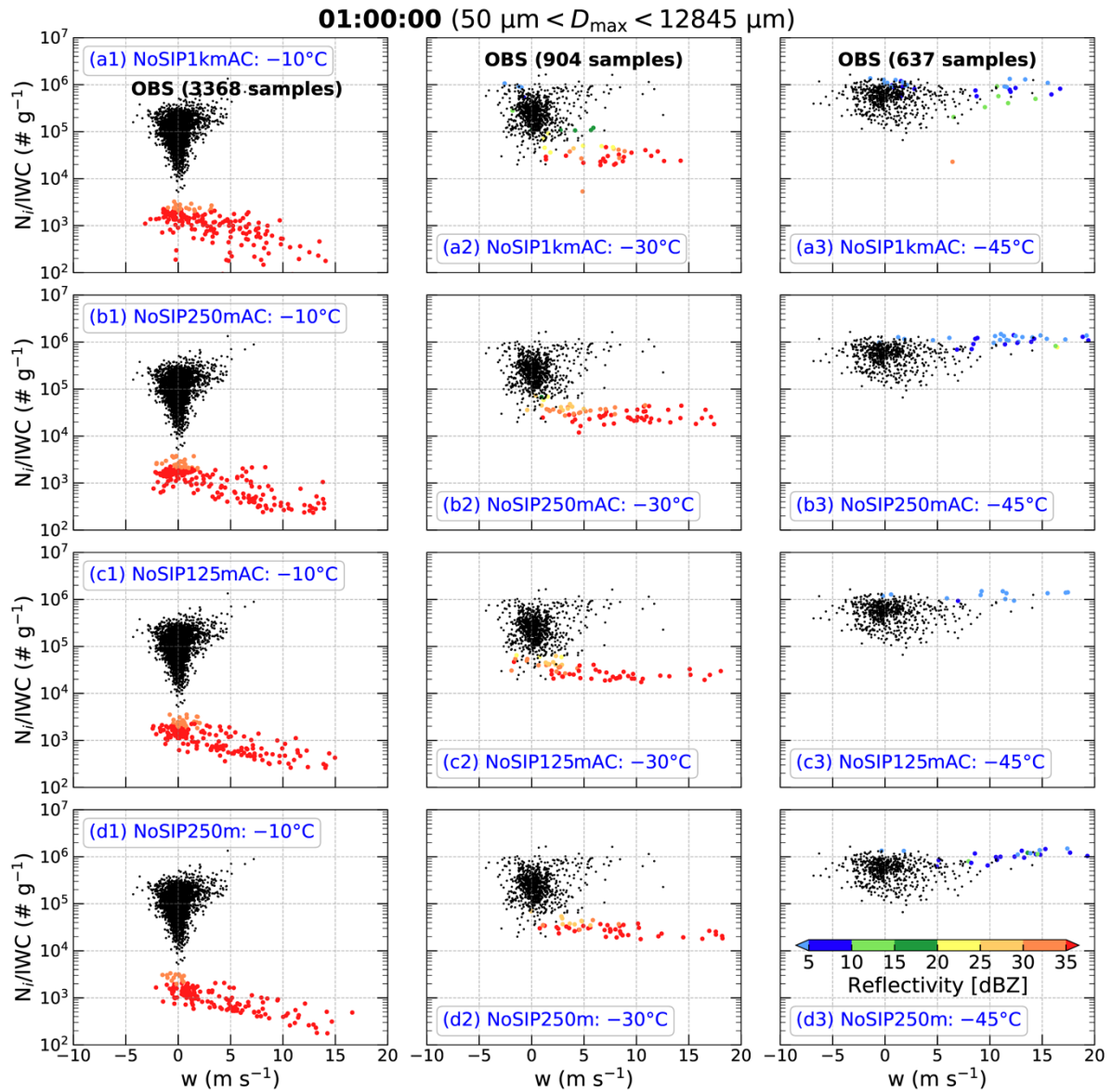


Fig. S1. Scatter plots of (black) observed and (colorized) simulated ice number concentration (N_i , $\# \text{m}^{-3}$) divided by ice water content (IWC, g m^{-3}) (denoted as N_i/IWC) as a function of vertical velocity (w , m s^{-1}) in regions with $IWC > 1 \text{ g m}^{-3}$ at temperatures of (left column) -10°C , (middle column) -30°C , and (right column) -45°C at $t = 60 \text{ min}$ in experiments (a1–a3) NoSIP1kmAC, (b1–b3) NoSIP250mAC, (c1–c3) NoSIP125mAC, and (d1–d4) NoSIP250m, respectively. The simulations at the three temperature levels are interpolated from the model outputs. The simulations with horizontal grid spacing $< 1 \text{ km}$ have been coarsened to 1 km for comparison by spatially averaging with a window size of $1 \text{ km} \times 1 \text{ km}$. The points are color-coded according to the magnitude of radar equivalent reflectivity factor (dBZ).

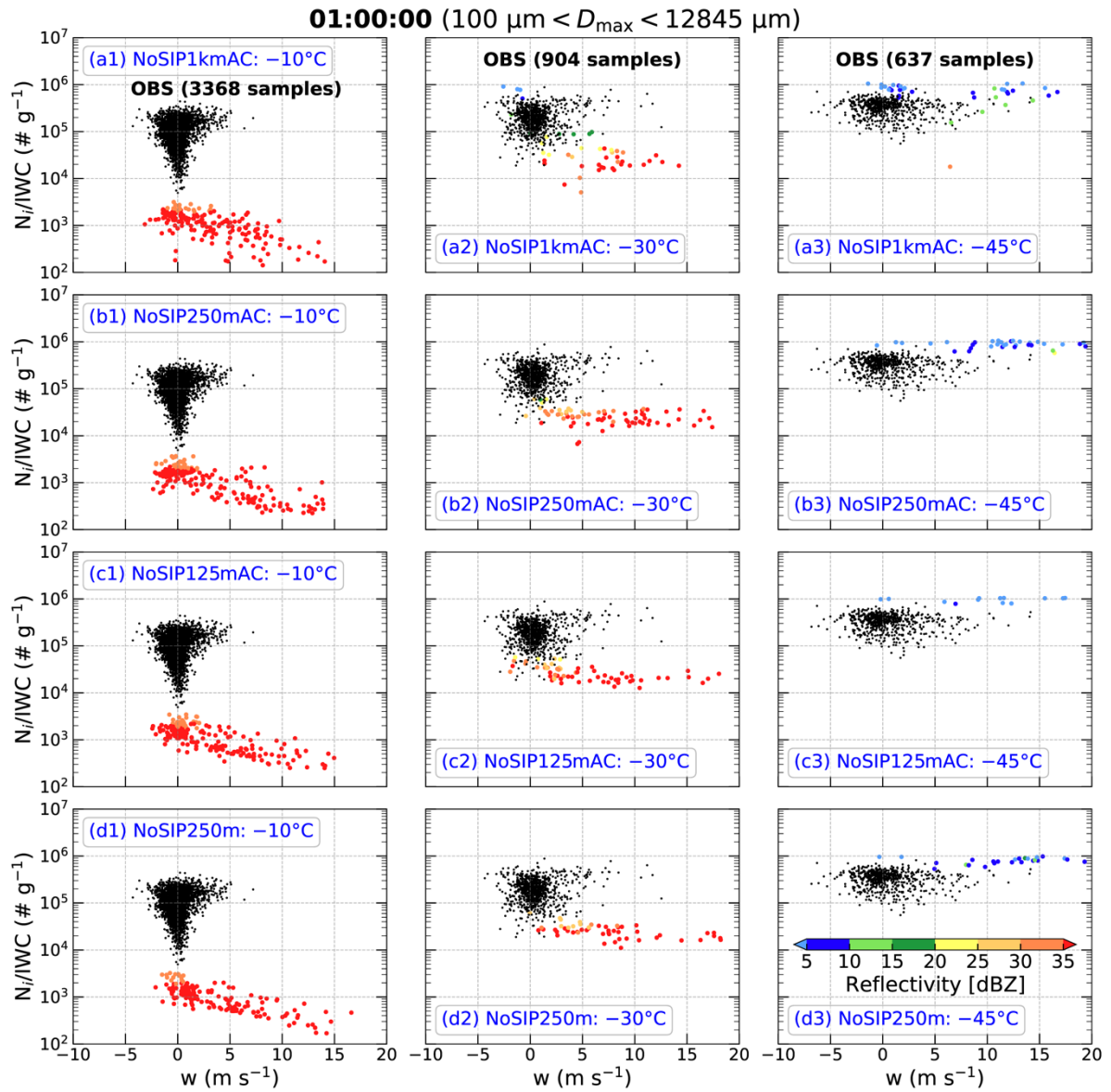


Fig. S2. As Fig. S1 but for experiments NoSIP1kmAC, NoSIP250mAC, NoSIP125mAC, and NoSIP250m for $100 \mu\text{m} < D_{\text{max}} < 12845 \mu\text{m}$, respectively.

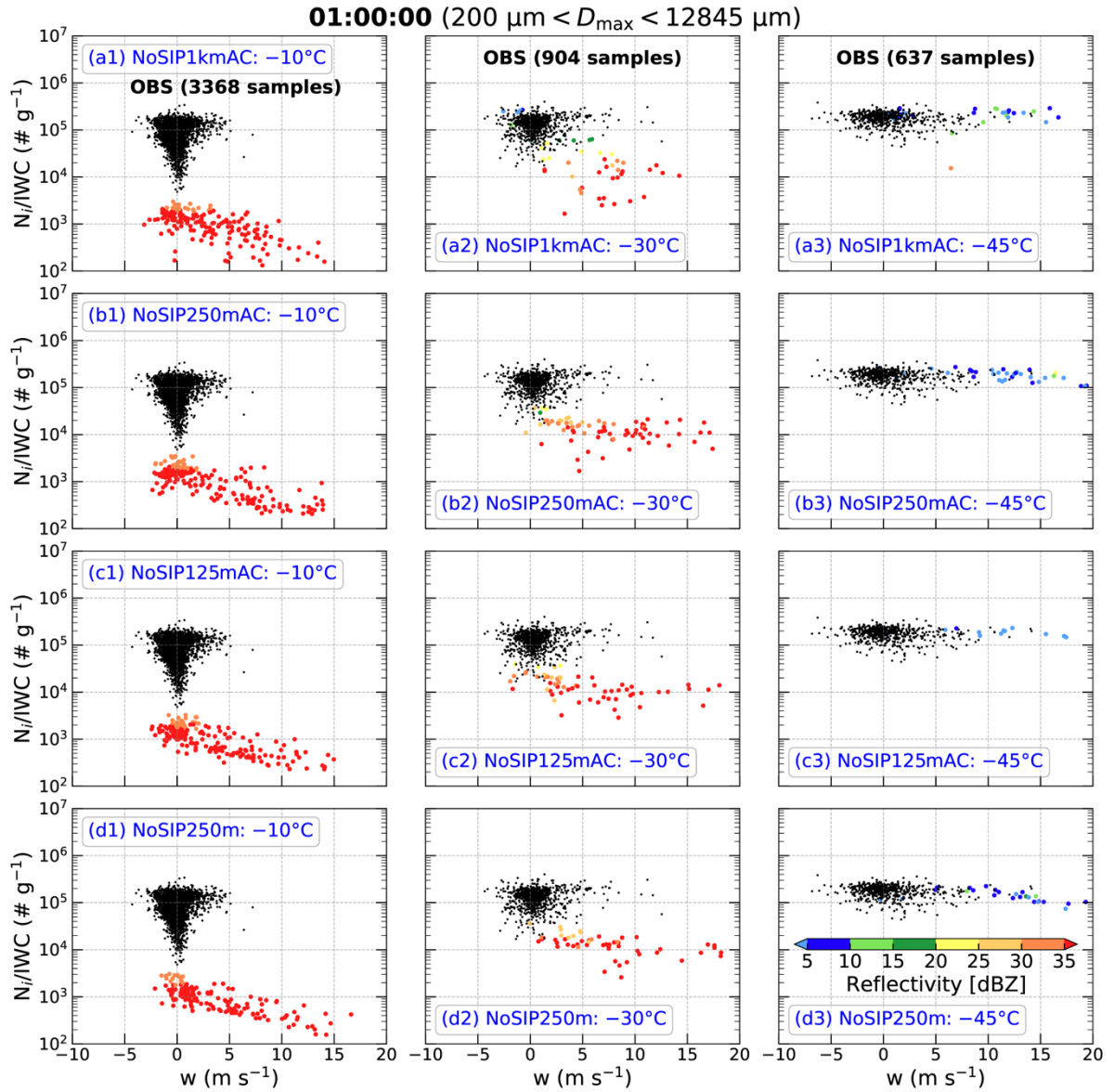


Fig. S3. As Fig. S1 but for experiments NoSIP1kmAC, NoSIP250mAC, NoSIP125mAC, and NoSIP250m for $200 \mu\text{m} < D_{\text{max}} < 12845 \mu\text{m}$, respectively.

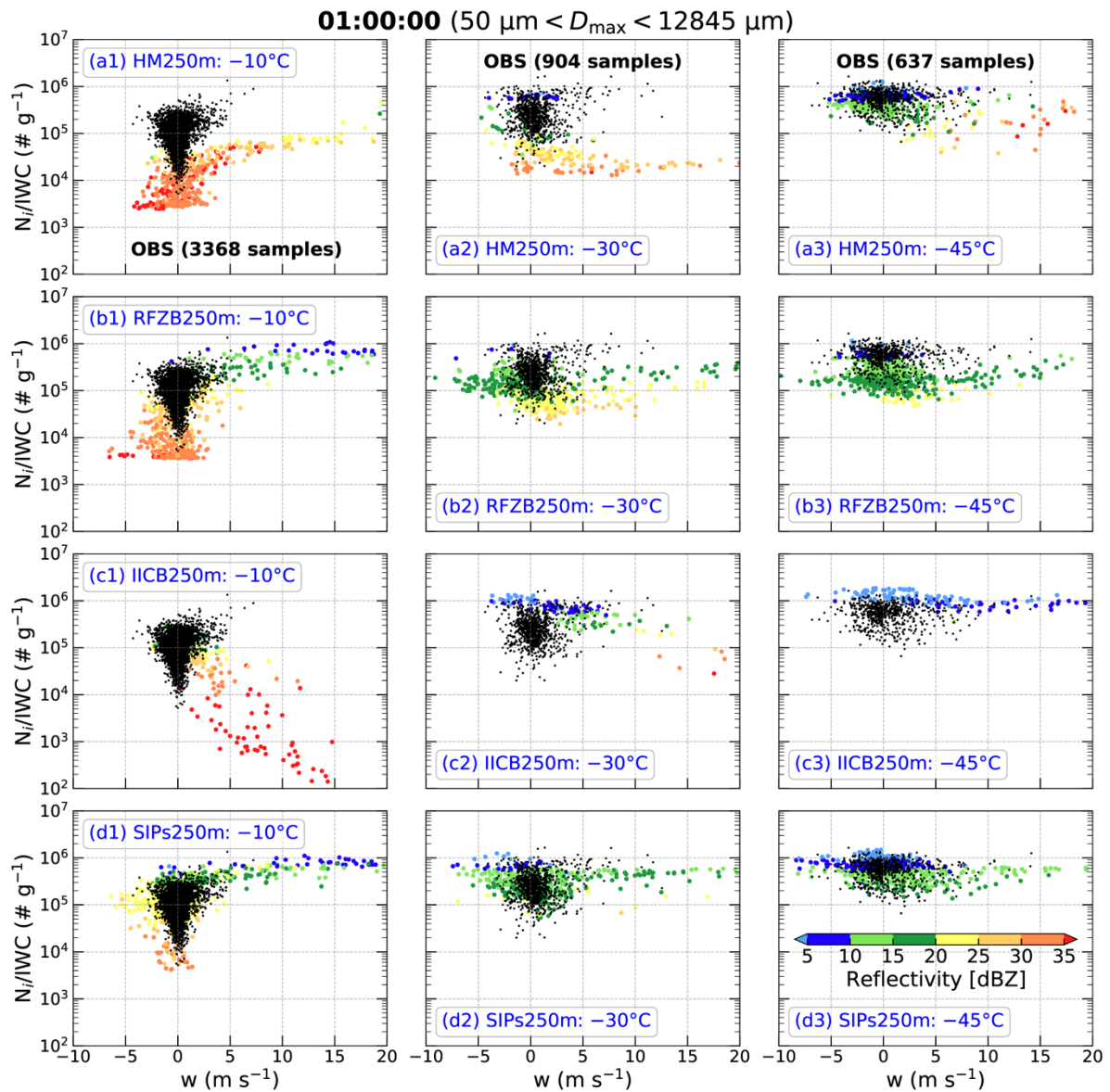


Fig. S4. As Fig. S1 but for experiments HM250m, RFZB250m, IICB250m, and SIPs250m for $50 \mu\text{m} < D_{\text{max}} < 12845 \mu\text{m}$, respectively.

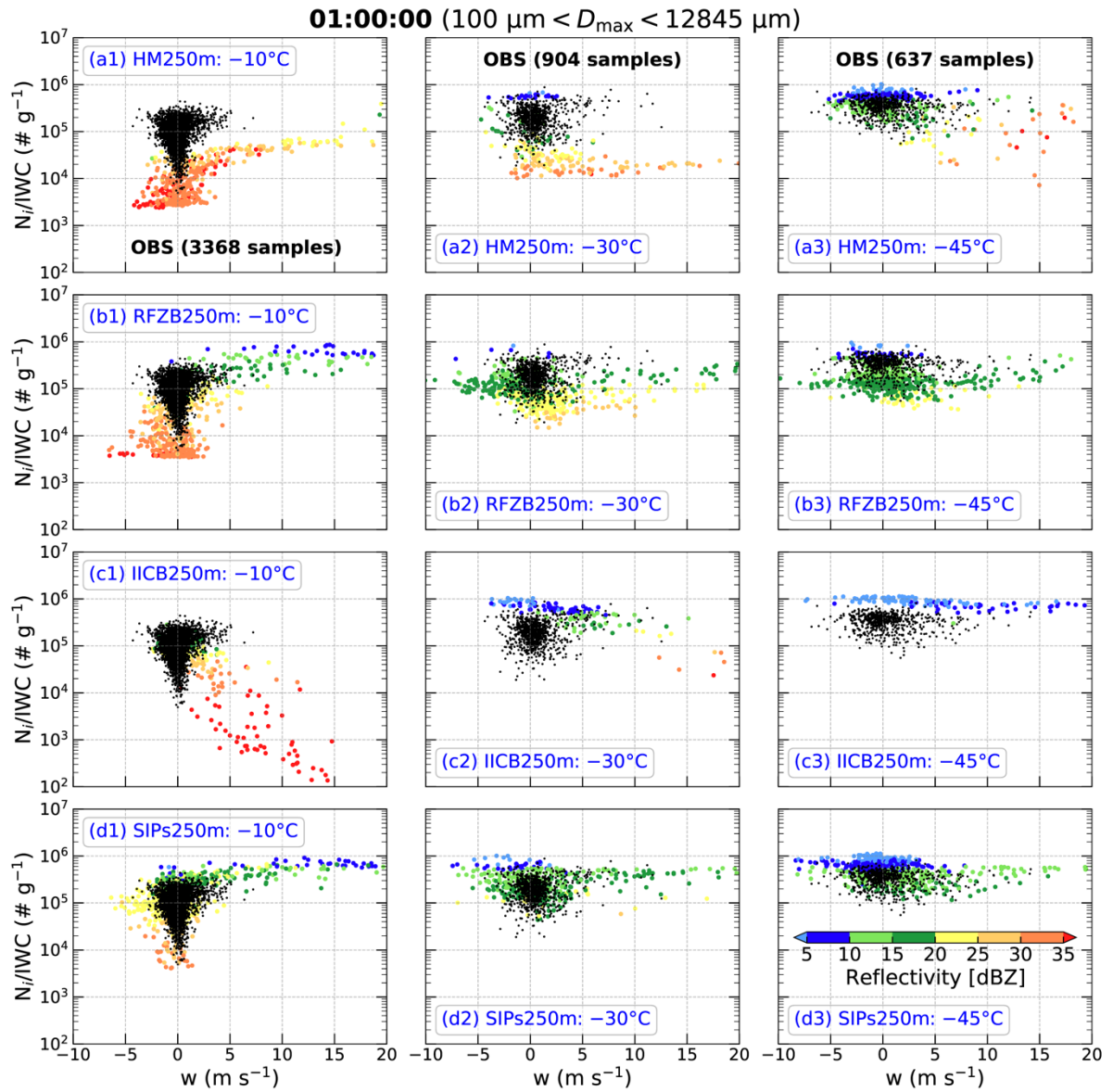


Fig. S5. As Fig. S1 but for experiments HM250m, RFZB250m, IICB250m, and SIPs250m for $100 \mu\text{m} < D_{\text{max}} < 12845 \mu\text{m}$, respectively.

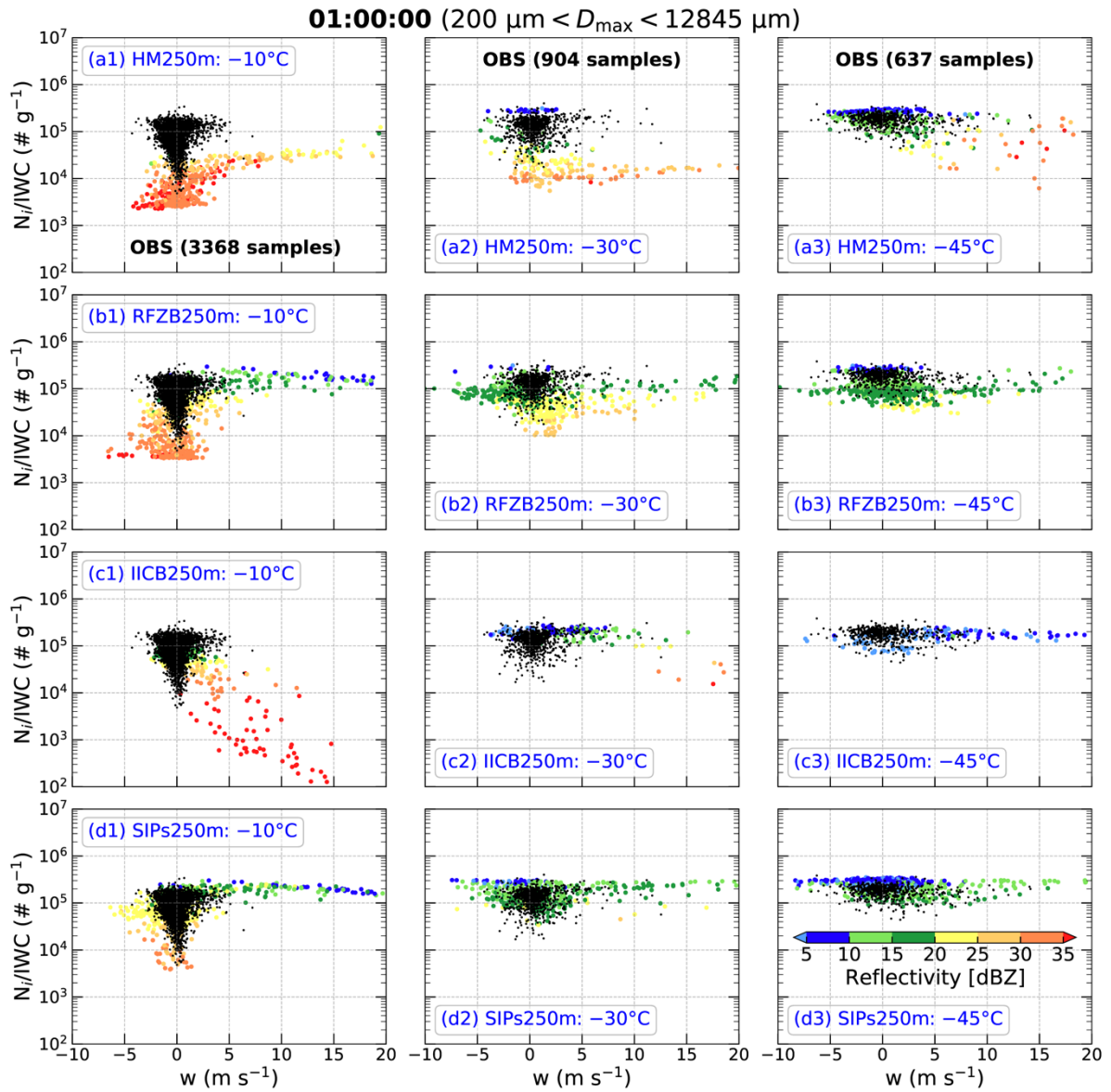


Fig. S6. As Fig. S1 but for experiments HM250m, RFZB250m, IICB250m, and SIPs250m for $200 \mu\text{m} < D_{\text{max}} < 12845 \mu\text{m}$, respectively.