



Supplement of

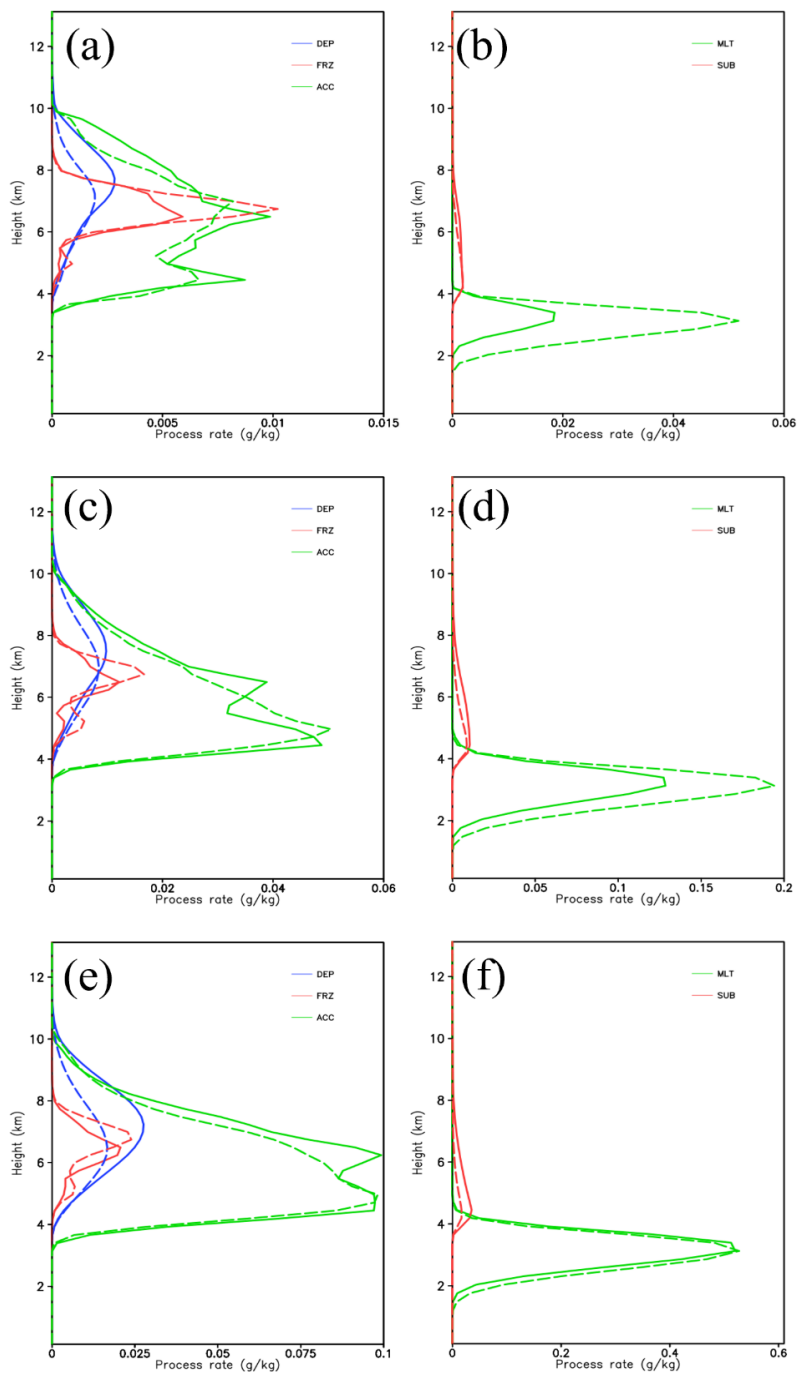
Introducing graupel density prediction in Weather Research and Forecasting (WRF) double-moment 6-class (WDM6) microphysics and evaluation of the modified scheme during the ICE-POP field campaign

Sun-Young Park et al.

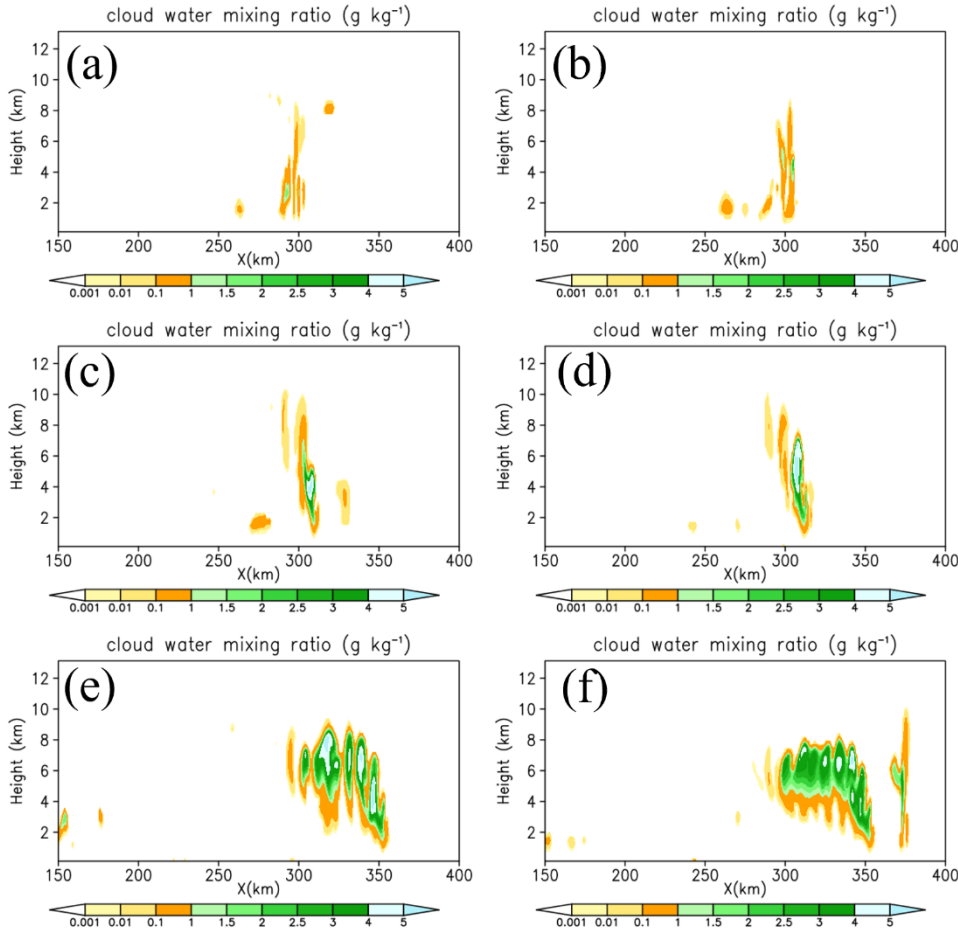
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Supplementary material:



5 **Figure S1: Vertical profiles for the domain-averaged (a) sources and (b) sinks of graupel mass mixing ratio in WDM6_FD (Solid line) and WDM6_PD (dashed line) at 1 hour (a and b), 2 hour (c and d), and 4 hour (e and f). The main source processes, namely, deposition (Pgdep; DEP), accretion (mean of Paacw, Psacr and Pgr; ACC) and freezing (Pgrz; FRZ) are plotted with the major sink processes, namely, sublimation (Pgsub; SUB) and melting (Pgmlt; MLT).**



10 **Figure S2: Spatial distribution of cloud water mass mixing ratio (g kg⁻¹) in WDM6_FD (a, c, and e) and WDM6_PD (b, d, and f) at 1 hour (a and b), 2 hour (c and d), and 4 hour (e and f).**

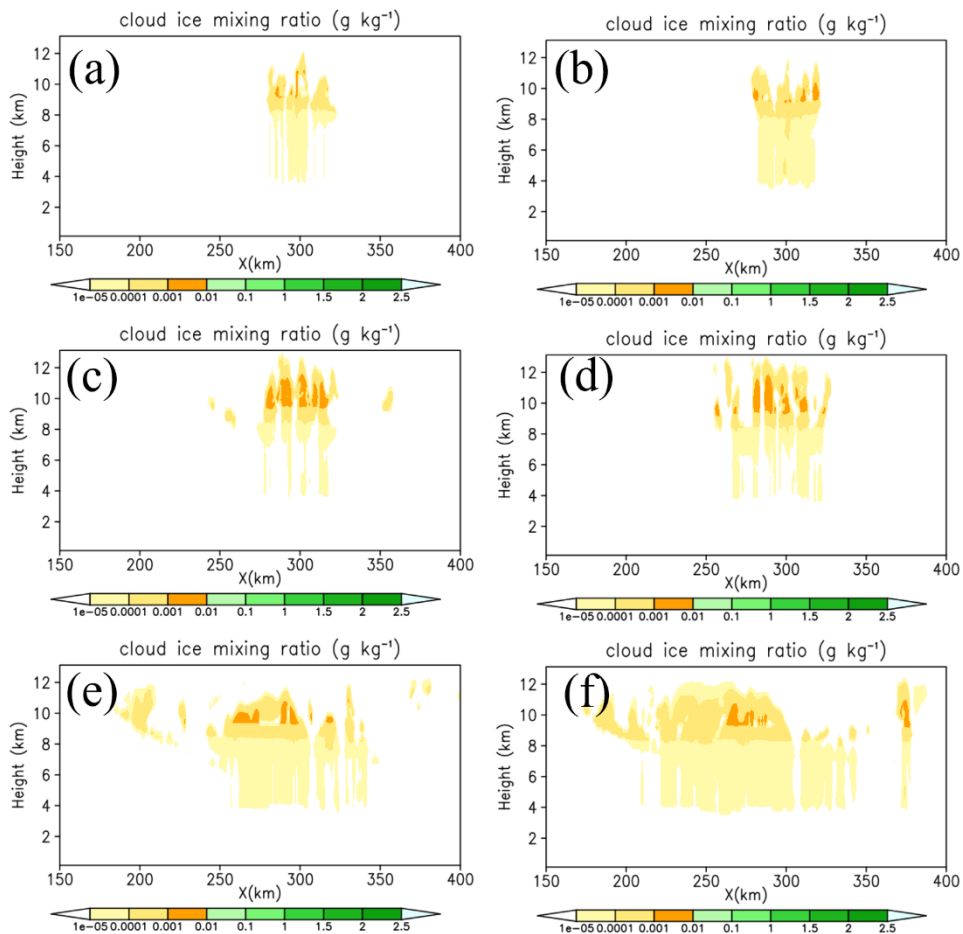
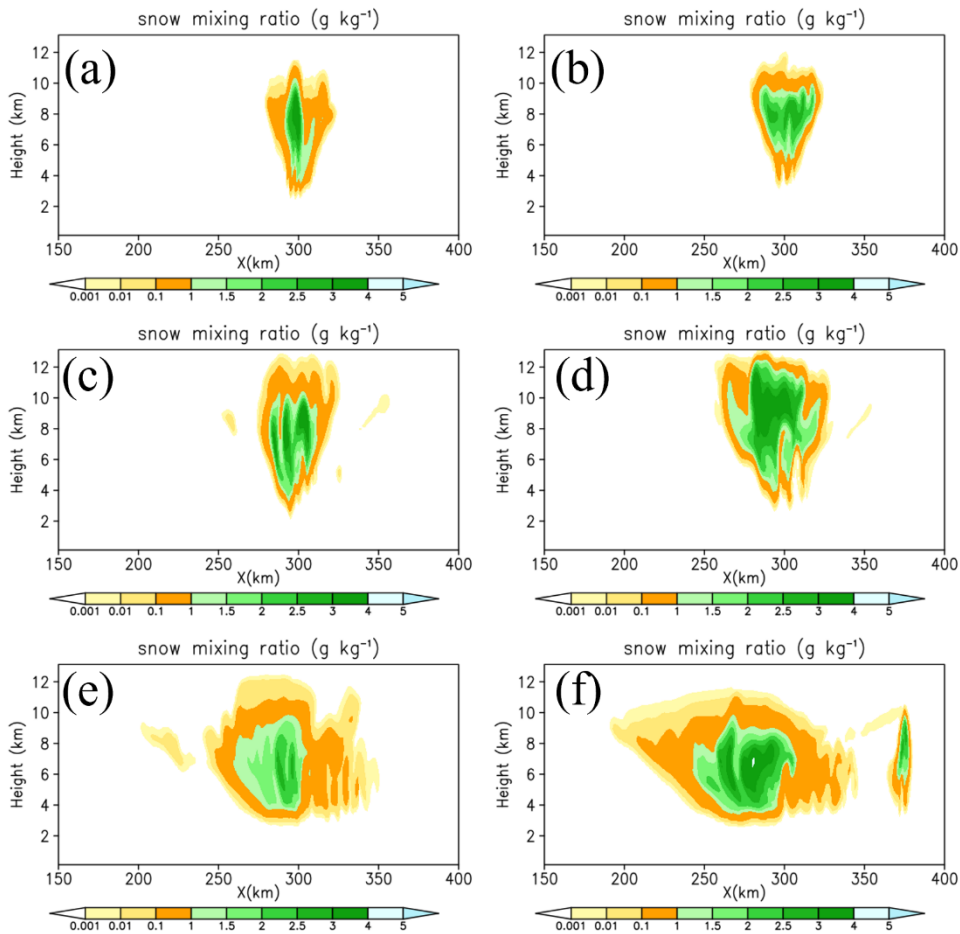


Figure S3: Same as Figure 2, but for cloud ice.



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Figure S4: Same as Figure 2, but for snow.

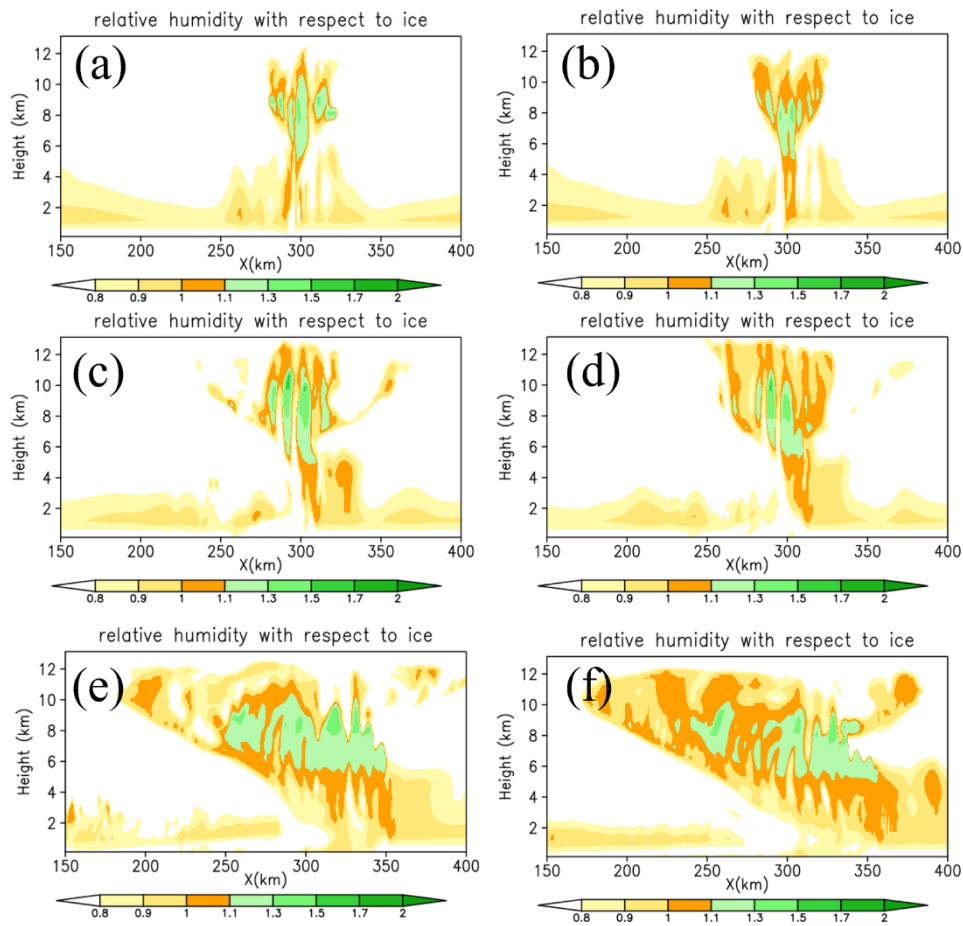


Figure S5: Same as Figure 2, but for relative humidity with respect to ice.

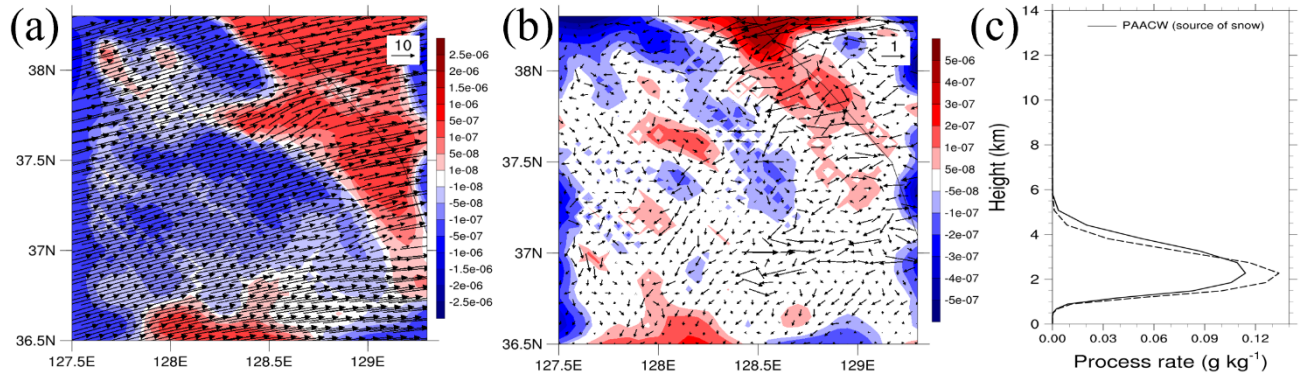


Figure S6: Snow advection ($\text{g kg}^{-1} \text{s}^{-1}$) and wind vector (m s^{-1}) at 850hPa for CL case from (a) WDM6_FD, and (b) the difference between WDM6_PD and WDM6_FD (WDM6_PD minus WDM6_FD). The vertical profiles of the time-domain-averaged Paacw process for C1 case are shown in (c). The solid (dashed) line represents WDM6_FD (WDM6_PD).