

Figure S1. a) Graupel mass concentration, b) IWP, c) IWF ($\text{IWP}/(\text{IWP} + \text{LWP}) \times 100$), d) LWP, e) riming rate, f) deposition rate over the cross-section. These quantities calculated in a) - f) were only over cloudy regions where the cloud area fraction is larger than 0. In brackets are the average over the the latitude. g) Is the precipitation mean (solid line), ensemble spread (shaded area) and CombiPrecip (dashed line) and j) the averaged topography over the cross-section.

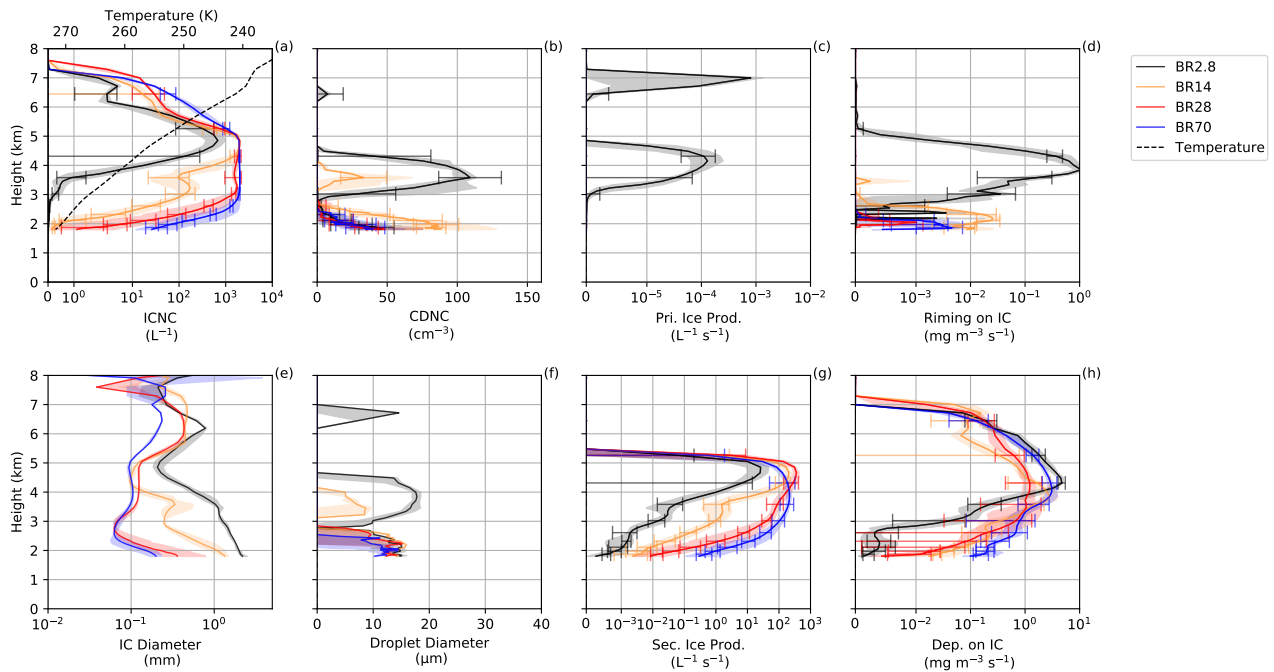


Figure S2. a) and e) Ice crystal number concentration (ICNC) and diameter, b) and f) cloud droplet number concentration (CDND) and diameter, c) and g) primary and secondary ice production, d) and h) riming and depositional (Dep.) growth of ice crystals at Gotschnagrat at 12:00 UTC for $\gamma_{BR} = 2.5$. The solid lines are the model mean with error bars showing model spread for each simulation. The shaded regions are the minimum and maximum values for the four closest model points. Ice crystals are denoted by IC.

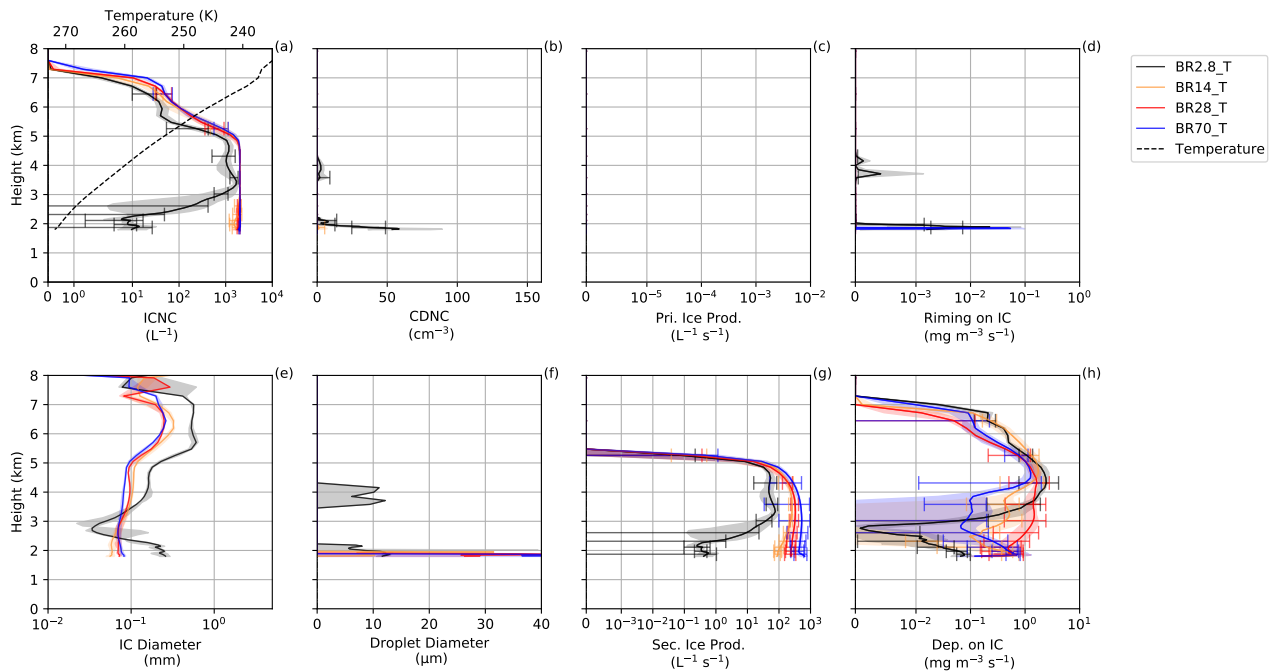


Figure S3. a) and e) Ice crystal number concentration (ICNC) and diameter, b) and f) cloud droplet number concentration (CDND) and diameter, c) and g) primary and secondary ice production, d) and h) riming and depositional (Dep.) growth of ice crystals at Gotschnagrat at 12:00 UTC for $\gamma_{BR} = 5$. The solid lines are the model mean with error bars showing model spread for each simulation. The shaded regions are the minimum and maximum values for the four closest model points. Ice crystals are denoted by IC.

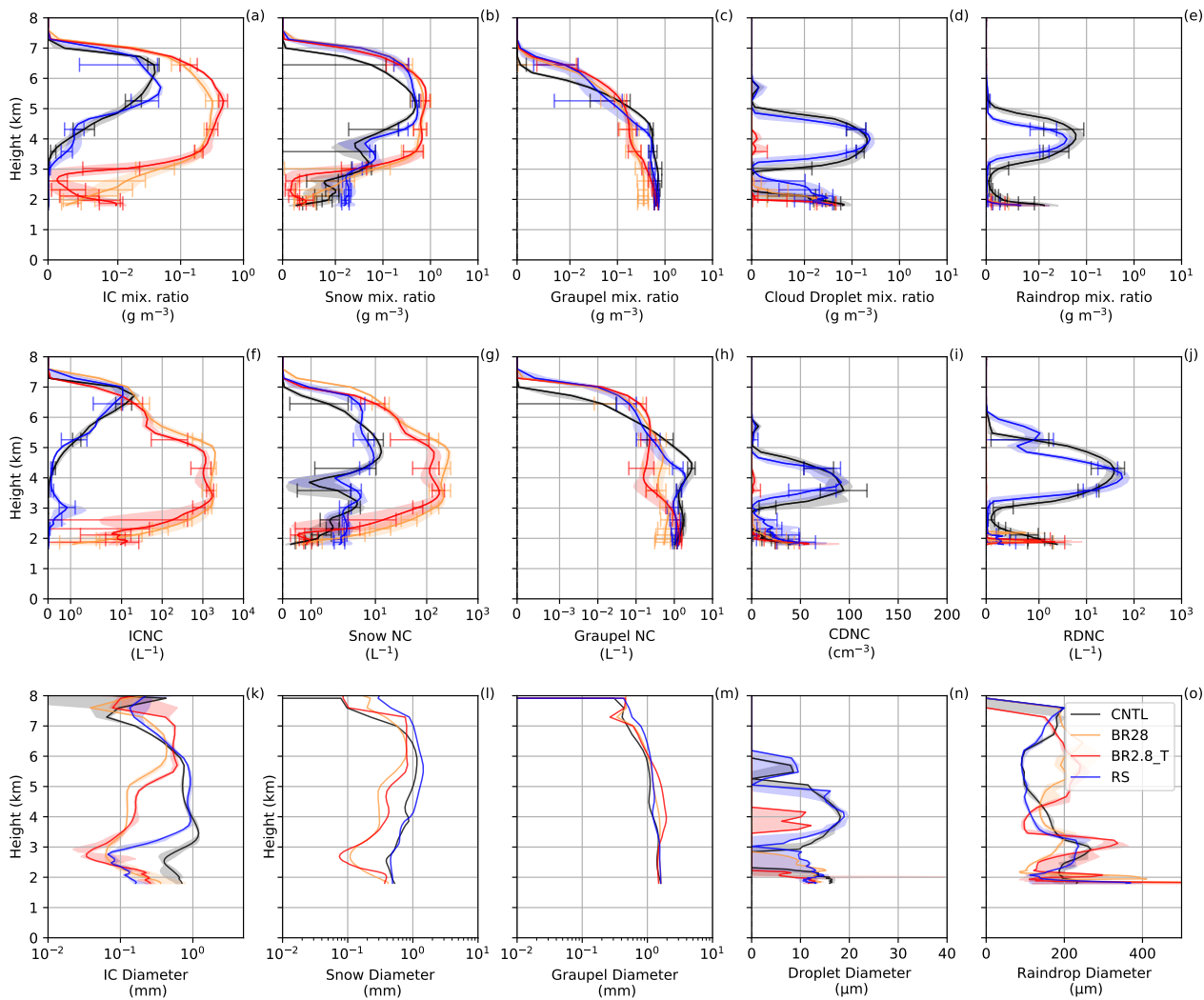


Figure S4. Hydrometeors mixing ratios, number concentrations and sizes at Gotschnagrat at 12:00 UTC.

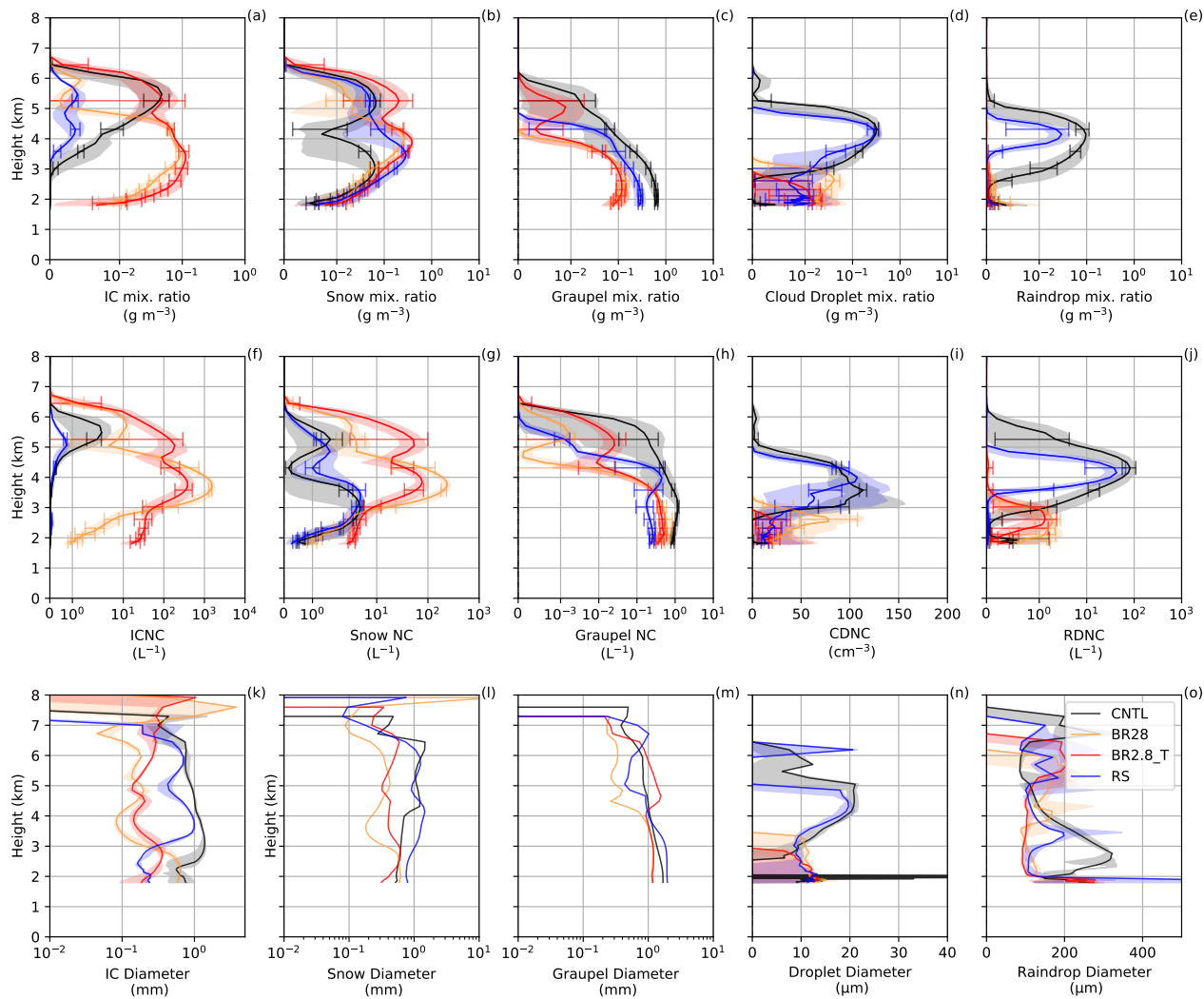


Figure S5. Hydrometeors mixing ratios, number concentrations and sizes at Gotschnagrat at 13:00 UTC.