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# *Corrigendum to* "The effect of secondary ice production parameterization on the simulation of a cold frontal rainband" published in Atmos. Chem. Phys., 18, 16461–16480, 2018

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We have found an error in the temperature criterion and tendency used within the breakup parameterization presented in Eqs. (4) to (6). While the number tendency $(\partial N_j/\partial t)_{\mathrm{coll},jk}$ was given in Eq. (4), the parameterization was in fact run with a mass mixing ratio tendency $(\partial q_j/\partial t)_{\mathrm{coll},jk}$. We have rerun the BR2sg simulation with these corrections and present the updated $N_{i,\mathrm{sec}}$ spatial fields from collisional breakup (Fig. 6). We note also that the units in Fig. 6 were given incorrectly as $\mathrm{d}N_i/\mathrm{d}t$ [$\mathrm{L}^{-1}\,\mathrm{s}^{-1}$] and should have been as in Fig. 5: $\log_{10}\mathrm{d}N_i/\mathrm{d}t$ [$\mathrm{L}^{-1}$ (half hour)$^{-1}$]. As stated in the observational study of this rainband, "graupel was notably absent in the data obtained" (Crosier et al., 2014). Given this limited amount of graupel at all altitudes, the updated field and the original shown in Fig. 6c do not differ qualitatively, although the magnitude of $(\partial N_{i,\mathrm{sec}}/\partial t)_{\mathrm{BR}}$ increases by 30 % to 40 % in select regions of the rainband. A non-zero contribution of breakup appears at higher altitudes as well. Rerunning the ALL simulation, the rime-splintering contribution remains dominant (not shown). Given these results, we amend one statement from Sect. 4.2 and one statement from the Discussion with the following italicized text:

- "There is also an altitudinal hierarchy [of the process contributions] ... The breakup is largest at a lower altitude of 1.5 km because the graupel mixing ratio is highest here, *although small contributions also appear at upper levels*."
- "The analogous $N_{i,\mathrm{sec}}$ field for ice–ice collisional breakup (Fig. 6c) is about *three to three and a half* orders of magnitude less than those for rime splintering (Fig. 5)."

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## References

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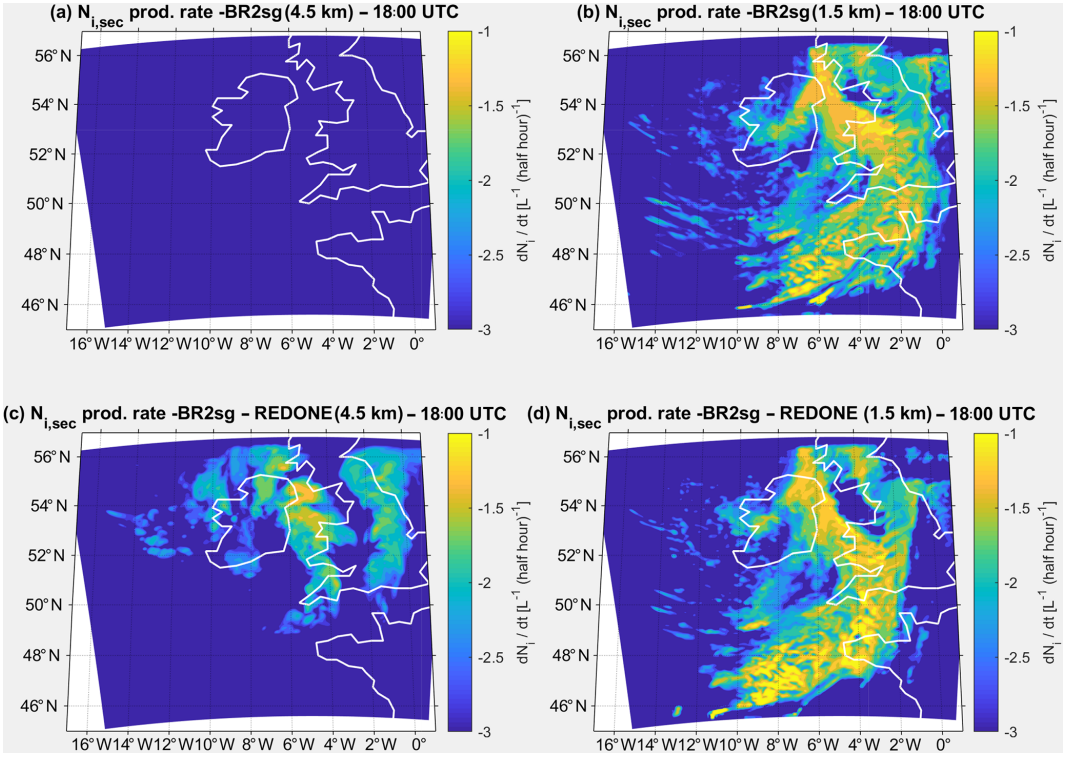


**Figure 6.** Maps of secondarily-produced ice crystal numbers between 18:00 UTC and 18:30 UTC from the original BR2sg simulation at 4.5 and 1.5 km (**a**, **b**) and from the updated BR2sg simulation at 4.5 and 1.5 km (**c**, **d**). The colorbars are logarithmic.