

Response to authors reply and revised version of ACP 2020-40 'A Microphysics Guide to Cirrus – Part II: Climatologies of Clouds and Humidity from Observations' by M. Krämer et al.

The authors have sufficiently replied to the comments and improved the manuscript accordingly. Therefore I recommend publication after minor revision.

Minor comments:

Section 2.2 reads already better than the first version, still I have a question concerning lines 155-160: *Good agreements were found, although it was noted that the inability of the modified gamma distribution to match the frequently bi-modal shape of the measured PSDs could lead to an overestimation of N_i in DARDAR-Nice. This typically occurs at temperature above -50°C and is expected to be cloud-type dependent, but Sourdeval et al (2018) showed that N_i still was in reasonable agreement with the in situ (within a factor of 2) down to $T = -30^\circ\text{C}$, which should cover the entire cirrus temperature ranges in this study.*

This looks like the agreements are within a factor of 2 for $T > -50^\circ\text{C}$ and in better agreement for $T < -50^\circ\text{C}$. Is this true? How much better would this be?

line 338, 339: 'restrictions in the detection of thicker ice clouds': lidar has no problems to detect thick clouds, τ can't be determined because of saturation; suggestion: 'restrictions in the τ **determination** of thicker ice clouds'

Section 6.2, lines 916- 918: *The data was collected twice a day, approximately at midday and at midnight (satellite equator-crossing time is 1.30 am/pm), from June 2006 to December 2016.* DARDAR-Nice uses combined CALIPSO-CloudSat, but since April 2011, CloudSat data are not available anymore at 1.30 am LT; since May 2012 CloudSat data are only available during daytime. So are the results presented in section 6.1 a mixture of 1.30 am/pm from 2006-2011 and of 1.30 pm from 2012-2016? Is there a day – night difference? Or is DARDAR-Nice using CALIPSO alone (with better sensitivity to thin cirrus during night)?

Typos

line 35: inside **of** the clouds : take out 'of'

line 155: measurements: add 's'

lines 157 & 158: N_{ice} instead of N_i

line 169: tropics: add 's'

line 243: 'as anvils' instead of 'and anvils' ?

line 344: likely **to** warm: add 'to'

line 400: patterns: add 's'

line 451: within **of** cirrus: take out 'of'

line 558: tops of **to** massive: take out 'to'

line 608: In addition, deep convection with fast updrafts that occasionally overshoot into the TTL. **Not a complete sentence**

line 963: Table ?? : should be replaced by Tables **2 and 3**

lines 964-965: by Bacer et al., 2018; Penner et al., 2018; Righi et al., 2019).

should be replaced by: by Bacer et al. (2018), Penner et al. (2018) and Righi et al. (2019).