*General Comments*

*The paper summarises the new reprocessing of the SEVIRI satellite cloud property data set. The data set has been extended in time, both forwards and backwards and additional parameters have been added such as cloud geometrical thickness and cloud droplet number concentration. The quality of the data set is high and it is clear a lot of work has gone into assessing the underly FCDR as well as the L2 and L3 products. The data set will be useful for many different weather and climate studies.*

*The paper is very thorough, products have been validated and compared at level2 (swath) and at level3 (monthly).*

*The products have been evaluated with the most appropriate reference data sets and with aircraft flight campaign data. It was very pleasing to see discussion of uncertainties on the data set and even evaluation of the uncertainty of the LWP data set, this is in line with best practice.*

*The paper is very clearly written and I found very few technical errors*

We are grateful to Caroline Poulsen for dedicating time to deliver this positive review. Below we provide answers to her comments, and address her remarks aiming to improve the quality of the manuscript accordingly.

*Specific Comments*

*For the comparison of CTH with Calipso it would have been good to see a plot of the standard deviation (Figure 8) and/or some discussion on what compensating errors there could be for example boundary layer clouds could be too high (miss classification of inversions) while cirrus clouds too low.*

Thank you for this suggestion. Indeed, Figure 8 alone is not informative regarding the variability in CTH. In the revised manuscript we will add maps in Figure 8 showing the standard deviations in CTH separately from CLAAS-3 and CALIOP, and the standard deviation of their difference. The revised figure is also shown below. The standard deviations of the two data sets are in good agreement, with lower values occurring in stratocumulus clouds (southeastern Atlantic) and higher values in part of the ITCZ, possibly associated with strong convection and frequent cirrus outflow. The standard deviation of the differences ranges between 1 and 4 km, with higher values also occurring near the equator.

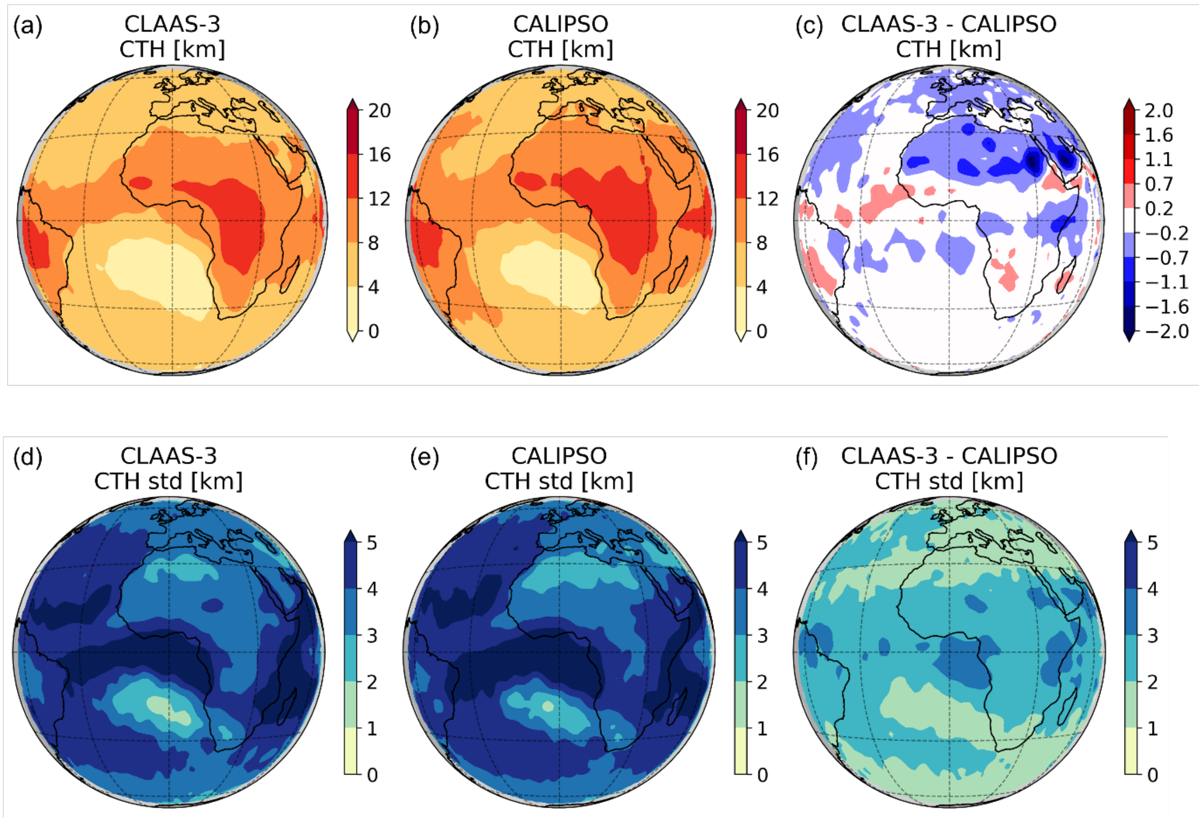
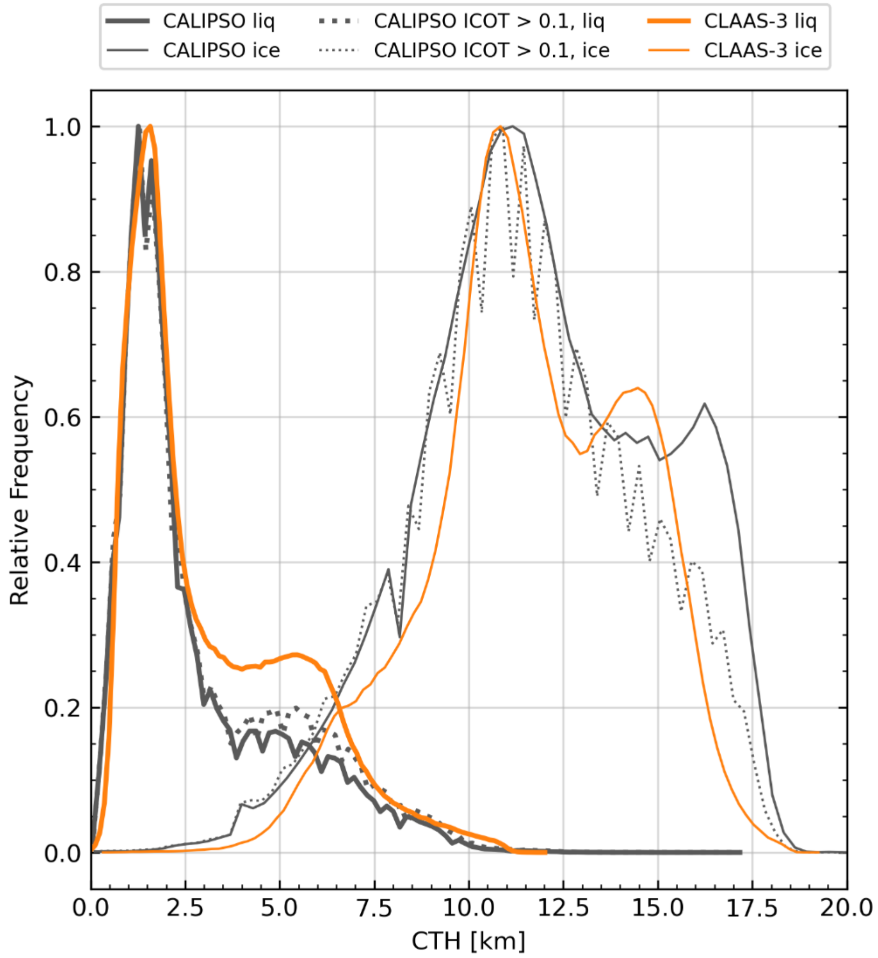



**Figure 1: Spatial distribution of the 2013 average level 2 Cloud Top Height (CTH) from CLAAS-3 (a), CALIOP (b), and their difference (c). Here CTH is estimated by collecting matchups to a regular 1.5° × 1.5° grid and averaging them within each grid box. The CALIOP CTH is taken from the layer where the top-down integrated COT (ICOT) exceeds 0.1. A 2-dimensional Gaussian filtering was used for noise reduction. Standard deviations of CLAAS-3 CTH, CALIOP CTH and of their difference are shown in (d), (e) and (f), respectively.**

Regarding possible compensating errors that could erroneously lead to a good agreement in the average values, we have plotted histograms of the occurrence of CTH from CLAAS-3 level 2 and CALIOP, separately for liquid and ice clouds, which show that the occurrence of such errors is not likely. The histograms are shown below, with similar ones discussed also in the CLAAS-3 validation report (CM SAF 2022d).




**Histogram of occurrence of level 2 cloud top heights from CLAAS-3 and CALIOP, separately for liquid and ice clouds. Dotted lines show cases when the CALIOP CTH is taken from the layer where the top-down integrated COT exceeds 0.1.**

As in Figure 8, the CALIOP CTH is taken from the layer where the top-down integrated COT (ICOT) exceeds 0.1. Results show that the agreement is overall good, especially for the liquid phase. It also appears that CLAAS-3 misclassifies a small amount of ice mid-level clouds as liquid (at CTHs of 5-6 km), while it contains more high ice clouds than CALIOP (at CTH near 14 km).

*Figure 10 why are there negative values of LWP AMSR2?*

Negative LWP values result from the retrieval algorithm and are not anymore forced to zero in the RSS products since version 7. We will clarify this by adding the following sentence after L491: “Note that the AMSR2 LWP retrievals from version V8.2 include negative values, which arise as a consequence of random errors in brightness temperatures, and are not forced to zero since that would lead to a positive LWP bias (Elsaesser et al., 2017).”

*Section 4.5 have the authors considered that the difference between CLASS and MODIS could also be due to different liquid/ice cloud fractions?*

Indeed, this is a possibility that was not discussed in the manuscript. While we compare in-cloud only IWP, differences due to different cloud phase may arise when temporally averaging the instantaneous/daily values to monthly mean values. We will discuss this point in the revised manuscript. Hence, a possible explanation of the systematically higher MODIS IWP would be if MODIS detects less (high) thin ice clouds than CLAAS-3. While we have not investigated this further, the systematically higher CTH in CLAAS-3 compared to MODIS, shown in Figure 9, supports this hypothesis.

*Technical errors*

*line 337 insert new line*

Done.

*while it maybe obvious that the x-axis in plots is year it would still be good to have this labelled.*

Labels added in Figs. 4, 9, 13 and 15.

*x-axis labelling on Figure 13*

Added.