First of all we sincerely thank the reviewers for their work in reviewing the manuscript. These reviews were helpul to improve the manuscript and we hope that their justified concerns will be answered here. The reviewer's comment is in normal color, while the answer is in blue.

Reviewer 2

1. Instead of introducing a fixed time-window around overpass time, they just used all of the ground-based radar data obtained during the comparison period of 15 months. This implies that CPR detected clouds are different from ground-based radar detected clouds. However, there is an assumption that CPR detected many clouds within 200km around an ACTRIS site contain the same ensemble of clouds detected by ground-based radar in the site although different time is chosen. The assumption is not clearly written/defined and justification of ignoring the time issue might be insufficient, e.g., diurnal variations of cloud structure and nature might occur. Some discussion of this point might be given. If they will add above mentioned points and related discussions, the manuscript will be hopefully improved.

This concern was also one we had during this study. Concerning the diurnal variations of the cloud structures, all the sites used in this study have day and night overpasses of the same order. Figure R1 shows an exemple of the contribution from both day and night overpasses for one of our site. We see that day and night overpasses have an equivalent contribution, this is also observed for the other sites of our study.

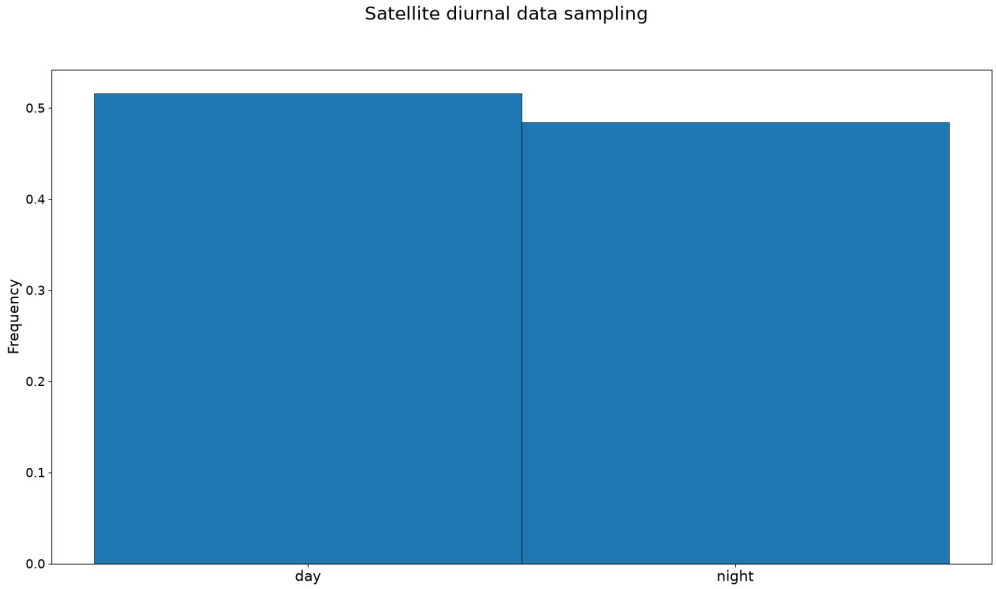

Figure R1: Frequency of day and night overpasses for the site of Juelich on the period from 2024-07-20 to the 2025-11-18.

We also had a look at the monthly data contribution. This is shown on figure R2. From this figure, we see that even though there are variations, the contribution is evenly distributed on the time period considered. The smaller contributions of the ground data during the first few months is due to the fact that the radar was switched off on some time intervals between July and the beginning of December 2024.

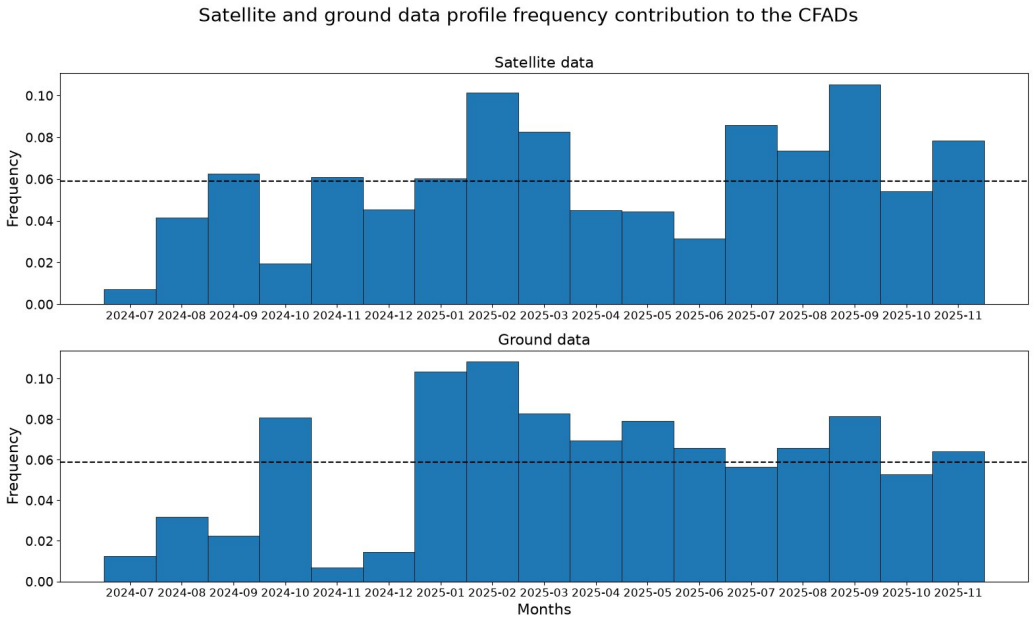

Figure R2: Frequency of the contribution to the dataset from the satellite (top plot) and ground (bottom plot) for each month for the site of Juelich on the period from 2024-07-20 to the 2025-11-18.

The decision to use all of the ground data instead of only data in a ±1h window around the overpass comes from the observation that in the majority of cases, the ground and satellite observe different clouds. On the 183 overpasses in the 15 months considered, less than 20 show similar clouds, hence why a long statistical comparison is needed. Single overpasses figures for a site will be added in supplementary material to show this. Limiting the the collection of ground data in a ±1h window drastically lower the number of profiles from the ground, as shown in appendix A. We therefore consider that evaluating the bias at the most statistically similar height bins leads to comparing similar clouds observed by both the ground and satellite. The weight of eventual outlayer data introduced by considering all the ground profiles should also be reduced by the fact that we consider the center of the fit to evaluate the bias, thus reducing the weight of outlayer data. As we see from Appendix A, considering a ±1h window or the whole ground data leads to similar bias results with our methodology. This leads us to think that with enough time, both ground data selection methods should converge to the same bias result.

Changes to the manuscript: As the discussion on this is in Appendix A, it was modified to improve its relevance. Supplementary material with figures from all the overpasses for the site of Juelich will be added.

2. Product name and the baseline(version) of the product should be explicitly written.

All mentions of products and baselines were checked. Lines 108, 124, 125, 126, 129, 211, 341, 371, 376

Changes to the manuscript: Lines 108, 125, 341, 371, 376, 444, changed to precise CPR FMR product. Line 435 changed to precise CPR TC.

3. In page 10-11, they wrote minimum detectable radar reflectivity is -35dBZ but in Figure 3, data with lower than -35dBZ seem to be used for comparisons. If they actually used data below -35 dBZ, the value of minimum Ze should be written.

We indeed had a binning issue in the figures where all the data was shifted by 1dB. This shift is not physical and only due to the figure configuration.

Changes to the manuscript: All figures with a CFAD (Figures: 3, A1, A2 , B1, B2, B3; B4, B5, B6, B7) were redone to correct this issue.

4. In page 11, Figure 3 2.a and 2.b, shapes of the frequency of reflectivity are different between CPR and ground-based radar. More fraction of small Ze are detected by CPR than by the ground-based radar. Contrary, in p.13, Figure 4 shows the shape are more or less similar and center position of the distribution is similar between the two. Clarification is needed.

Figure 3 shows the reflectivity frequency of the whole datasets, while figure 4 shows the reflectivity frequency for the 8.6km height bin for both satellite and ground. This shows that although the global reflectivity frequencies are not very similar, considering each altitude independently shows more similarities between the datasets. This can be read lines 283-284 of the manuscript. Please let us know if you think clarification is needed.

Changes to the manuscript: Figure 4 was redone with bigger font to ease the distinction.

5. In page 13, line 287, the first parameter. It seems only two values of centers to derive correlation. Then it is not clear how to derive the correlation of two centers.

For each height bin, the correlation between the ground and satellite centers is given by the correlation between all the points in a ±500m vertical height window around the considered height bin. This gives 11 points to evaluate the correlation. This is precised line 291-292 of the manuscript. Please let us know if you think clarifications are needed.

6. In Page 15, height bin selections relied on three parameters. For example, sigma ratio is lower than 0.4. Please add some discussions why the three values are selected.

The choice of the parameters threshold values were made with the following considerations: For the centers correlations, the selection value should be the highest as possible (a high correlation meaning a high vertical similarity between the reflecivity). For the sigma ratio, the selection value should be the lowest as possible (lower sigma indicates a higher statistical similarity at the given height bin). For the R^2, the selection value should be the highest as possible to ensure that the fits accurately represent the data. The three values were then chosen empirically with these considerations in mind while trying to keep the highest number of selected height bins at the end of the selection process. The sensitivity test we performed showed that tunning these thresholds (corr: ±5% R^2:± 5%, sigma: ±25%) does not change the final bias. However these parameters can be adapted if the situation requires it, for example if there is not enough data available for convergence of the bias estimation.

Changes to the manuscript: A discussion on the choice of the parameters values was added lines 303-309.

7. In page 18, line 385, Since same minimum Ze were used for both CloudSat and the ground radar to derive biases CloudSat, is it correct that the bias change attributed to the change of power of CloudSat?

We do not attribute the change of bias to CloudSat but to the ground radar. As CloudSat calibration has been very stable through time (https://airdrive.eventsair.com/eventsairwesteuprod/production-nikal-public/7b9ae858c1db40028ec1c6e6144a3d4d), we use CloudSat to evaluate the calibration of the ground radar as it was done in previous studies (Protat et al.2009, 2011 and Kollias et al. 2019). Moreover the variations observed with the CloudSat are the same than the ones observed by ground teams of the Lindenberg site, comparing the MIRA observations to an MMR at the site. The use of CloudSat serves a dual purpose. First it shows that timeseries of comparisons can be done with our algorithm. Second, it allows us to study the comparison time needed to obtain a reliable bias as we can have long time series using CloudSat.

Changes to the manuscript: The discussion lines 393-398 was added to be more precise on which instrument causes these bias variations.

8. In pages 23 and 24 Figure A1 and A2, dynamic range of color bar for frequency in A1 is different from A2. Please use the same. Same for B3 and B4.

Our figures do not have the colorbar for the frequency as they don't have the same number of data. If we would use the same colorbars we would loose some contrast in the CFADs for cases with a larger number of data.