Reviewer 1:

Q1. Line 120: "2.2 Research data", the description is too simple. The distribution of the 66 ground based TCC observation should be given, such as see(figure 1). The ground based TCC is about 0 to 10? and the FY-2F/CTA should be 0-100%?

Response: In Figure 1, the black flags indicate the 66 ground-based observation sites in the Xinjiang region. We added data descriptions in line 113, line 116-117, and line 273-275.

In line 113: " Black flags represent the 66 TCC ground observation stations in the Xinjiang region. "

In line116-117: "of these, 24 ground observation stations are distributed in Northern Xinjiang (NX), 10 in Tianshan Mountains (Tianshan) and 32 in Southern Xinjiang (SX)."

And in line 273-275: "The altitude of Xinjiang is divided into four levels: less than 1000 m (31 ground observation stations are distributed), 1000-1500 m (22 ground observation stations are distributed), 1500-2000 m (8 ground observation stations are distributed) and greater than 2000 m (5 ground observation stations are distributed) in this paper.

The ground based TCC is 0 to 10, and the FY-2F/CTA is 0-100%. In our data processing, we multiply the ground-based observations by 10% to match them with the satellite data.

Q2. Line 133:"where the projection method is Mercator projection, the nearest neighbor method is used for resampling. Secondly, selecting ground-based observations that match the timing of satellite observations".
(1) Which satellite/CTA data you use? You did Mercator projection? Why use Mercator projection?(2) "Nearest neighbor method", what distance?(3) "match the timing" ,how many minute you use？ the same time? Please give the details.

Response: We used the cloud total amount products of FengYun-2F stationary satellite (FY-2F/CTA).

We apologize for our carelessness. At first, we made a Mercator projection with a set of data, but because the FY-2/CTA products on the website of the National Satellite Meteorological Center used the equal latitude and longitude projection, we ended up

using the data of the equal latitude and longitude projection, and forgot to modify it in the article. At present, the changes have been made in Line120-125 of the article, which is "FY-2F/CTA customized from the data service network of National Satellite Meteorological Center (http://satellite.nsmc.org.cn/portalsite/default.aspx)from June 1, 2015 to May 30, 2016, the total number of data is 8317, with a spatial resolution of $0.1°×0.1°$, the time resolution is 1h, the projection method is equal latitude and longitude projection."

We reorganized the data processing methods as detailed in lines 134-139, which is "Selecting ground-based observations that match the timing of satellite observations, and the abnormal observations are eliminated through the spatial distribution of the ground observation stations, and the stations with continuous observation for more than 20 days are selected for the preliminary quality control of the ground observation data; The satellite cloud cover data are extracted according to the time, longitude and latitude information of the ground observation stations, and the hourly data of TCC observed by the ground observation stations are matched with those observed by the satellite, and the total number of matched data is 80,855."

Q3. Line144 to Line 147:"When the observation of ground station is clear sky, but the satellite detection result is cloud, then the effective cloud arithmetic average is performed on the points in a certain area around the point, and if it is still clear sky, then the satellite is judged to have missed the detection, this point is recorded as Yn." Please check is it right? It's not consistent with " ③ When the observation of ground station is clear sky but the satellite detection result is cloud, it would be judged that the satellite misjudgment and be recorded as Ny."

Response: We are very grateful to the reviewer for your care and diligence in finding mistakes of the article. We have change this part into " When the observation of ground station is cloud, but the satellite detection result is clear sky, then the effective cloud arithmetic average is performed on the points in a certain area around the point, and if it is still resulted clear sky, then the satellite is judged to have missed the detection, this point is recorded as Yn". The specific modification are in Line 144-147 of the revised article.

Q4. Line 155:"they are considered to be stronger that the values of difference are greater than 2, they are considered to be weaker that the values of difference are less than -2;" and the consistency rate (CR), strong rate (SR) and weak rate (WR) can be expressed as Eq. (5) to Eq. (7) respectively.is there any cite paper?

Response: We have supplemented the relevant citations in Line 153-156, the specific content is "For the consistency analysis of FY-2F/CTA, if the absolute values of the difference between FY-2F/CTA and ground-based manual TCC observations are less than or equal to 2, they are considered to be correct; if the values of difference are greater than 2 or less than -2, they are considered to be stronger or weaker respectively (Li et al., 2018); Then the consistency rate (CR), strong rate (SR) and weak rate (WR) can be expressed as Eq. (5) to Eq. (7) respectively (Han et al., 2015)"

Q5. It should give some description for the figures in the paper .For example , with Figure 2, it should tell the reader which is PR distribution, which is the MR distribution at first. The reader will not be confused and search the information in Figures.

Response: We modified Figure 2 by enlarging all the points and legends in the figure to make the image clearer, and added the markings (a), (b)......(i) to each figure. We added the description for the figures in Line 209-211, the specific content is "Figure 2. The precision, consistency and error spatial distribution map of FY-2F/CTA products in Xinjiang. Where, from Figures (a) to (i) denote PR, FR, MR, CR, SR, WR, Bias, AE, RMSE respectively. The total number of all valid matches is 80855, among them, 29750 are distributed in NX, 10884 are distributed in Tianshan and 40221 are distributed in SX."
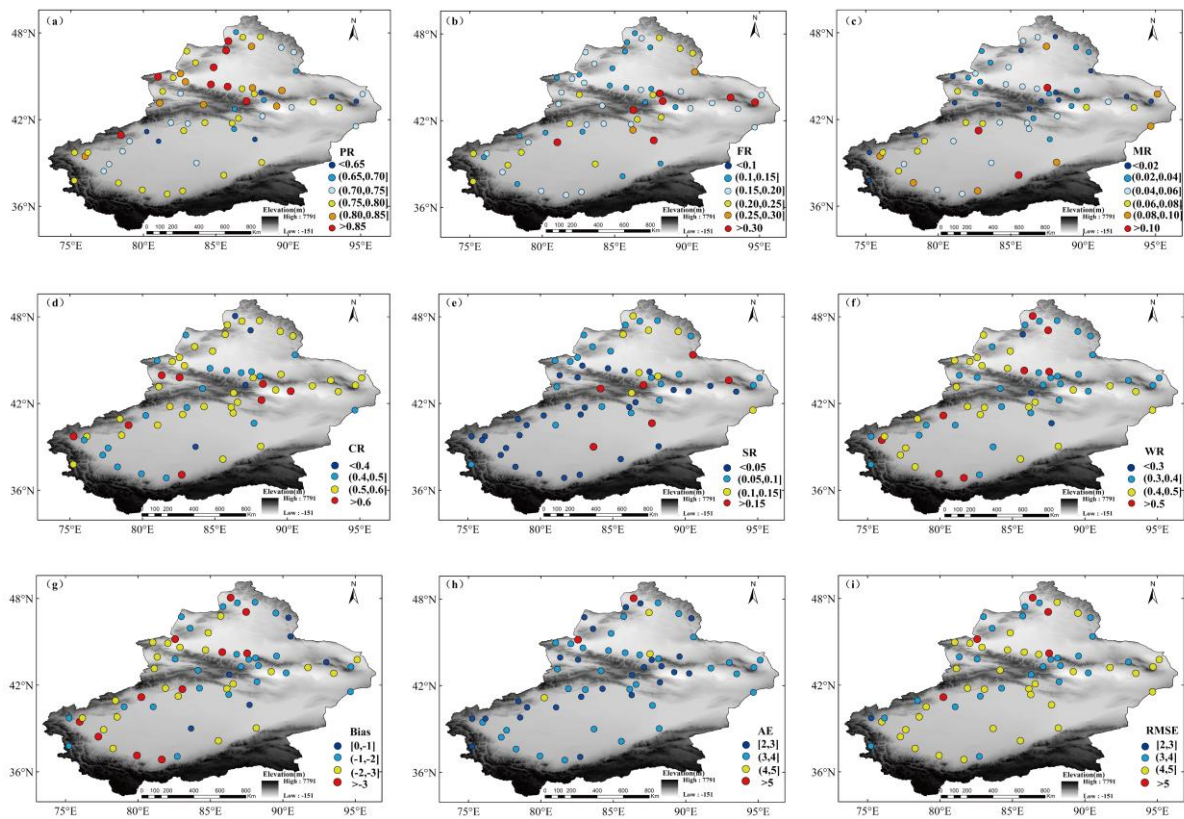
Figure 2. The precision, consistency and error spatial distribution map of FY-2F/CTA products in Xinjiang.

Where, from Figures (a) to (i) denote PR, FR, MR, CR, SR, WR, Bias, AE, RMSE respectively. The total number of all valid matches is 80855, among them, 29750 are distributed in NX, 10884 are distributed in Tianshan and 40221 are distributed in SX.

Q6. Line 179: should be 1.375um ,not "gm" .Same Line 180.

Response: We apologize for our carelessness. Here the unit is "μm", we have modified this content in Line 179 and Line 180.

Q7. Line 186: Line 188: Line 198: FT-2F/CTA is not right.

Response: We apologize for our carelessness. Here is "FY-2F/CTA", we have modified this content in Line 185, Line186 and Line 197.

Q8. Line 276, "It is observed that with the increase of altitude, the PR and CR of FY-2F/CTA present a decreasing trend", It seems that decreasing trend is not obvious.

Response: We agree with the comment. We have changed this sentence into " It is observed that with the increase of altitude, the PR and CR of FY-2F/CTA present a slightly decreasing trend (k_{PR} , the slop of first-order linear regression of PR and altitude, is -3.95; R^2_{PR} , the coefficient of determination of PR and altitude, is 0.932 (except for the altitude of greater than 2000 m). k_{CR} is -2.12; R^2_{CR} is 0.544), but the PR increases significantly when the altitude is greater than 2000 m." in Line 275- 278.

Q9. All results should be given the numbers of sample. how many matching data author used and got the conclusion? and how about the significance test? Otherwise ,the reader can not be convinced.

Response: Thanks for your great advice. We have added a note about sample size and matching data to the description of each figure.

In line 209-211: Figure 2. The precision, consistency and error spatial distribution map of FY-2F/CTA products in Xinjiang. Where, From Figures (a) to (i) denote PR, FR, MR, CR, SR, WR, Bias, AE, RMSE respectively. The total number of all valid matches is 80855, among them, 29750 are distributed in NX, 10884 are distributed in Tianshan and 40221 are distributed in SX.

In line 235-237: Figure 4. The precision, consistency and error of FY-2F/CTA products in complicated underlying surface of Xinjiang. In this case, the number of samples is 9196, of which 1650 are distributed in snow and ice underlying, 1596 in desert underlying, 992 in city underlying, 1653 in grassland underlying, 1653 in forest underlying, 1652 in plowland underlying.

In line 253-254: Figure 5. The scatter plot of FY-2F /CTA and ground-based manual TCC observations in Xinjiang. The total number of all valid matches is 264, among them, 66 in January, 66 in April, 66 in July, and 66 in October.

In line 283-285: Figure 7. The precision, consistency and error of FY-2F/CTA products at different altitudes conditions of Xinjiang. Among them, the number of samples is 37939 for altitude less than 1000 meters, 27080 for altitude between 1000

to 1500 meters, 11232 for altitudes between 1500 to 2000 meters and 4604 for altitudes greater than 2000 meters.

In line 305-306: Figure 8. The precision, consistency and error box plot of FY-2F/CTA products in dust and non-dust effect period of Xinjiang. In this case, the number of samples is 153 in Tazhong and 151 in Qiemo.

In line 336-337: Figure 10. The precision, consistency and error comparison box plot of FY-2F/CTA under different TCC levels in Xinjiang. The number of samples is 24931 for clear sky, 7954 for partly cloudy, 9557 for cloudy, and 38413 for overcast.

In line 244-246: The correlations between FY-2F/CTA and ground-based manual TCC observations are best in July and October, and worst in January, and all of them pass the significance test of 0.01 except for January.

Q10. In "3.3 The difference between FY-2F/CTA products and Manual observed TCC under various cloud cover levels of Xinjiang ". The FY-2F/CLA product's resolution is 0.1 °*0.1 °(one point covers 0.1 °*0.1 °area), ground based TCC data is the station data (scatter data). How to consider and deal with difference of the coverage of two types of data?

Response: In the data processing process, we based on the latitude and longitude of the ground observation stations, which are matched with the satellite products, and the values of the satellite products are extracted directly. Firstly, considering that clouds are different from the land surface, the spatial variation in a small area is not as drastic as that of the land surface; secondly, the ground-based artificial observation is a positive zenith observation, which may be slightly coarser than the resolution of the FY-2F/CTA product of 0.1 °*0.1 °. So, relatively speaking, such a direct match is feasible.

Q11. Line 352: "highe" should be "higher".

Response: Here is "higher" , we have modified this content in Line 355. We apologize for the language problems in the original manuscript. We have double checked and modified the word spelling.