

Interactive comment on “Stratification observed by the in situ measurements from the Swarm satellites” by Xiuying Wang et al.

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Sorry for the delaying response because of some emergency event.

We thank the referee for reviewing our paper and giving us valuable suggestions.

The one by one response to the suggestion is as following.

- 1) F107 and Sunspot indices data were downloaded from NOAA. We re-downloaded the data, and found no mistake. We may use only one index, F107 or Sunspot number.
- 2) Explanation to the spatial selection criterion. As we know the topside ionosphere is varied in spatial distribution, but in a very limited spatial space, we think the variation is small enough and can be neglected. Here we select 5 degree in longitude as the

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longitude criterion. To support this decision, we provide the research results that the neglected longitude variation can cover a larger extent.

We will make it clearer in the modification version.

3) We will explain the identification process in detail in the modification paper. Here a short explanation. As the plasma data from Swarm satellites is 2 Hz sampling rate, it is too complicated to compare these high sampling rate data directly. Therefore, the data along the orbit track are down sampled, and then we compare the down sampled data. For example, we calculate the average between latitude $[-5,-4)$, and compare the average data from the two satellites. In this way, all the cases that average from Swarm B is greater than that from Swarm A are identified. To prevent the occasionally variation of the data, continuous 5 points with positive data difference, namely 5 degree latitude, is defined as an event.

As to the F2 peak height, the normal F2 layer peak height is 200 to 400km when in moderate to low solar activity condition, especially for nighttime observations. If the peak height is above the satellite height, normally stratification events occur, these are the chances to identify the events by satellite observations.

For this problem, we will give some explanation in the modification paper.

4) We are sorry for this misunderstanding. In figure 3a, the magnetic equator is from dipole magnetic coordinates. We compare it with the dipole magnetic coordinates from IGRF-2016, there is no distinct difference. We will add additional explanation to this figure.

5) We will modify the paper following this suggestion.

6) Sorry for the mistake. It is Fig. 3(b-4). We will improve the paper as suggested in the modification version.

7) We will modify the grammar error in the revision version. Sorry for poor English.

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