

Reply to Referee No. 1

(referee comments are red; author replies black; new manuscript text blue)

1. I am confused by the statement on the value of Au 0.9 and 0.8, such as “. . . the height above which the temperature profile is more than 90% (0.9) and 80% (0.8) due to the measurements”, which appears in several figure captions. This seems to contradict to the statement on “a priori” on page 8 line 14-16, “the choice of a priori has little effect” below the cut off height “on retrieved temperature. . .”. I can understand the latter statement, but the former one, seems to me, would be other way around. So, I would appreciate if the author could clarify either one of the statement in the revision.

Thanks for catching that, you are correct. There is a typo in that sentence and we have changed “above” to “below”.

2. The author argues the large “geophysical variability” in January, peaked at 41 km, is related to SSW (page 9 line 18-19). However January has the least amount of measurements based on Table 1. Could the lack of measurement contribute to this large “geophysical variability”? In addition, SSW would have impact all the way up to the middle latitude upper mesosphere (Yuan et al., 2012), but the variability is small between 70 km and 80 km in Figure 4 and the author contributes the large variability between 60 km and 70 km to MILs. So, I am not convinced the “geophysical” nature of these large variability as the author states.

The variability in January is most probably to some extent related to a lack of measurements in this month. Therefore, we would change the sentence:

There is a peak at 41 km in January which is related to sudden stratospheric warmings during winter (Argall and Sica, 2007).

to

There is a peak at 41 km in January which may be related to sudden stratospheric warmings during winter. However, the lower number of measurements in January will also contribute to the variability, and determining the extent of each contribution is not possible.