

### *General comments*

This is a useful study, which considers a situation with a reduction of satellite observing platforms and the observing system for the stratosphere has to rely on other observations, direct or indirect. This is of interest to scientists working with stratospheric data. The authors test the trajectory mapping technique for a range of stratospheric dynamical regimes, including a sudden stratospheric warming, which owing to the rapidly changing dynamical situation is challenging to capture.

Before the paper is suitable for publication in ACP, the authors should address a number of issues:

- (i) The verification of the TM data using Aura MLS data (Sect. 3.5) – I understand that the latter is used as the a priori for the NDACC data. This suggests that this validation may not be sufficiently independent. The authors should discuss this. The other referee remarked on this;
- (ii) Sect. 3.4 does not seem to me to add much to the discussion. Is it needed?
- (iii) The authors could improve the figures – for example, the value of  $n$  is difficult to read in Figs. 1-2. Similarly, other text above the plots is difficult to see (e.g., Fig. 3);
- (iv) Another way of filling in gaps in the satellite observational record would be to use analyses/reanalyses of the middle atmosphere, e.g., from ECMWF. Could the authors mention this alternative, and discuss the relative advantages/disadvantages of each approach?

### Style points/typos

The text: There is a slight mixing of UK and US English spelling. The authors should stick to one or the other. I suggest US English, as this is more prevalent in the text.

P. 12784

L. 11: Finland.

L. 23: I suggest you do not start a sentence with an acronym.

P. 12789

L. 8: Do you need “obviously”?

P. 12793

L. 22-23: Perhaps use “challenging” instead of “interesting”.

P. 12795

L. 19: I suggest replacing “probably” with “likely”.

P.12799

L. 14: Do you need “indeed”?

P. 12800

L. 5: Good results of what?

P. 12803

L. 11: Do you need “seems to be able”? Would “is able” be more succinct?

L. 20: The sentence including “unveiled weak points” is not clear to me. Please rewrite.

L. 22: Do you need “apparently”?