

Interactive comment on “How robust are stratospheric age of air trends from different reanalyses?” by Felix Ploeger et al.

Anonymous Referee #2

Received and published: 11 February 2019

This study presents an inter-comparison of three reanalyses with respect to the simulation of the Brewer Dobson circulation (BDC). Age of air (AoA) was used as a metric for the BDC and estimated by using the Chemical Lagrangian Model of the Stratosphere (CLaMS) driven by the respective reanalyses. Beside stratospheric mean age, the full age spectrum was calculated to investigate the robustness of the representation of climatology, seasonality, and trends of the BDC in reanalysis data sets.

The paper is well written and clearly structured and provides a comprehensive analysis of the stratospheric BDC in different reanalysis data sets. It is suitable for publication in ACP after minor revision.

General comments:

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1. The first general comment refers to the usage of terms like "older age". It is a similar expression like "warmer temperatures (instead of higher temperatures)" and used in common speech (everyone knows clearly, what is meant), although it is a false use. I would suggest to replace this notion by "higher age" or "older air", that are in form and content correct descriptions. This replacement should be done throughout the text.

2. Some of the coloured figures are hard to read, because the description of contour lines are too small or the colour is too dark (Fig. 6c, dark blue contour lines on dark grey colour), Fig 7d-f, Fig. 13.

3. Please explain how you estimated the AoA trends and significance. Did you consider correlations between near by values, when you calculated the trend patterns?

Minor comments:

Page 1, line 2: "analyze" or "analyse" ?, please be consistent throughout the text.

Page 2, line 27: Please, do not cite publications, which are in preparation and not available to the reader.

Page 9, line 25: Did you mean Fig. 2c? Fig. 2f does not exist.

Page 22, line 10: "Birner, personal communication"

Page 24, line 4: The corresponding finding by Chabrilat ...

Page 28, line 32-33: Please cite correctly: Chabrilat, S., Vigouroux, C., Christophe, Y., Engel, A., Errera, Q., Minganti, D., Monge-Sanz, B. M., Segers, A., and Mahieu, E.: Comparison of mean age of air in five reanalyses using the BASCOE transport model, Atmos. Chem. Phys., 18, 14715-14735, <https://doi.org/10.5194/acp-18-14715-2018>, 2018.

Page 30, lines 24-26: Please cancel the citation "Hauck, M ..."

Page 32, line 2: Please cancel "in preparation".

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