

Comment on "The Brewer-Dobson circulation in CMIP6" by Abalos, M. et al., ACPD, 2021

Dear authors, thank you very much for this interesting study on the Brewer-Dobson circulation in the new CMIP6 simulations. Going through the manuscript we noted 2 points, where our research can help to interpret your results. Please see below our two points.

Best wishes
Petr Sacha and Roland Eichinger.

- POINT 1:

L212: "Common features include [...] particularly strong trends in the subtropical-midlatitude lower stratosphere."

Please note that the existence of these regions has been pointed out and studied in detail in Šácha et al. (2019, ACP). These trend patterns can serve as a visual proxy for structural changes in the lower stratosphere in the models.

- POINT 2:

Please clarify your methodology with respect to the usage of w^*_bar (results around Figs. 7, 10 and 11).

As reported in the supplement of Dietmüller et al. (2018) for CCM1 simulations, there were inconsistencies in the type of w^*_bar provided by the modelling groups, despite the log-pressure formula being solicited in the data request.

In the DynVar data request by Gerber and Manzini (2016), the log-pressure formula is also solicited. If there are inconsistencies in the w^*_bar formulae between CMIP6 simulations, this can result in differences in wstar climatology and trends as quantified in Eichinger and Sacha (2020). Hence, our findings can help to narrow down the w^*_bar differences in Fig. 11. Generally, note that due to stratospheric cooling, the relation of log-pressure metres to geometric metres is not constant, which projects also to the magnitude of w^*_bar trends.

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