Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-1072-SC1, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Sensitivities of modelled water vapour in the lower stratosphere: temperature uncertainty, effects of horizontal transport and small-scale mixing" *by* Liubov Poshyvailo et al.

P. J. Nowack

peer.j.nowack@gmail.com

Received and published: 30 November 2017

The authors discuss transport and feedback processes that modulate stratospheric water vapour changes and the related uncertainties. Could the authors discuss the potential importance of ozone in this context both for the seasonal cycle and climate change projections, see for example:

Fueglistaler, S., Haynes, P. H., and Forster, P. M.: The annual cycle in lower stratospheric temperatures revisited, Atmos. Chem. Phys., 11, 3701-3711,

https://doi.org/10.5194/acp-11-3701-2011, 2011.

Nowack, P. J., Luke Abraham, N., Maycock, A. C., Braesicke, P., Gregory, J. M., Joshi, M. M., Osprey, A., Pyle, J. A.: A large ozone-circulation feedback and its implications for global warming assessments, Nature Climate Change 5, 41-45, https://doi.org/10.1038/nclimate2451, 2015.

Nowack, P. J., Braesicke, P., Abraham, N. L., & Pyle, J. A.: On the role of ozone feedback in the ENSO amplitude response under global warming. Geophysical Research Letters 44, https://doi.org/10.1002/2016GL072418, 2017.

Dietmüller, S., Ponater, M., & Sausen, R. (2014). Interactive ozone induces a negative feedback in CO2-driven climate change simulations. Journal of Geophysical Research: Atmospheres 119, 1796-1805. https://doi.org/10.1002/2013JD020575, 2014.

Could the authors extend their discussion to include the implications of their transport and small-scale mixing work for trace gases more generally, in particular for the distribution of ozone in the TTL, which will feedback onto stratospheric water vapour?

This would be a valuable addition to the manuscript and broaden the potential impact across this interdisciplinary field of research.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-1072, 2017.