

***Interactive comment on* “The Evolution of Zonally Asymmetric Austral Ozone in a Chemistry Climate Model” by Fraser Dennison et al.**

Anonymous Referee #2

Received and published: 26 June 2017

General comments: In this study the evolution of zonally asymmetric Austral ozone in a specific CCM is examined using elliptical diagnostics for the first time to describe ozone structure in 2 dimensions. The model has some advantages (e.g. direction displacement) and disadvantages (e.g. underestimation of ozone). The model describes the depletion of the 20th century including the westward movement of the asymmetry of ozone and the eastward movement later after ozone starts to recover. These are novel and important findings. It confirms the westward shift of planetary waves induced by zonally asymmetric observed ozone as shown in earlier model studies for the Northern Hemisphere (Gabriel et al. 2007; Peters et al. 2015, 40 years of ERA40 ozone) and for the Southern Hemisphere (Crook et al. 2008). The change of the shift direction after ozone starts to recover is an expected result but the shown evidence that zonally asym-

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metric ozone its increase and decrease influences the planetary wave propagation and finally the position of the polar vortex seems for me still very important.

Specific comments: introduction The westward shift of planetary wave due to given ozone waves in earlier studies should be mentioned clearly relative to NH and SH including references including the improved NAM and SAM activity in midwinter.

discussion it should be mentioned clearly that the findings fit very well to former results mentioned above

to Report #2 (iii) authors comment

I do not agree, the shown results for the NH are also relevant for this study, same radiative heating and Dynamics.

recommendation for minor revision after consideration of specific comments

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-405>, 2017.

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