

Interactive comment on “Quantitative performance metrics for stratospheric-resolving chemistry-climate models” by D. W. Waugh and V. Eyring

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We thank Dr Grooss for his comments.

We are not sure what is meant by "optimal model performance", but in our response to Dr Grewe we had clarified what the grade represents and the statistical significance of differences in the grade.

The discussion of weighted ozone projections in section 4.4 is (as Dr Grooss acknowledges) for illustrative purposes, and we don't feel we must define how best to choose the weights. We would like to do this, but given that we have only evaluated a subset of processes that are important for stratospheric ozone which is noted in several places in the area, this is an area where future research is needed. We state this in

the Conclusions.

We disagree that ozone is the best parameter to use for weighing future projections. We focus on a process-oriented approach rather than looking at the quantity of interest. As referee 2 states, there is not a robust relationship between how well models simulate past and present quantities (such as ozone) and the reliability of future projections of that quantity. However, we feel that it is better to assess, and develop weights based on, the ability of models to reproduce key processes (focusing on processes that control ozone) rather than looking at ozone itself. Because of this we have focused on non-ozone diagnostics. In addition the Müller et al. diagnostic was not included in E06. Supported by both referees, we argue that focusing on the diagnostics that have been applied in E06 is appropriate, and has the strength of being directly traceable so that readers can easily look at each comparison graphically (see comment Referee 1).

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