

Interactive comment on “Quantifying uncertainty in projections of stratospheric ozone over the 21st century” by A. J. Charlton-Perez et al.

Anonymous Referee #2

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The title of this paper begins “quantifying uncertainty...”, so I expected to read an analysis of the uncertainty (in DU, years, etc.) of the CCMVal ozone projections. Having read the paper, the analysis is relative and qualitative. In a revised MS, I would like to see the authors use their methods (which appear to be useful and clever) to actually tell the reader how (un)certain we are about the recovery of the ozone layer. If this is impossible, then the title should be changed to “Sources of uncertainty...” or “Relative uncertainties...” or something similar.

In 1980 the ozone layer was already affected by ODSs. CCMVal 1 model runs began in 1980 (which is apparently when this year came from). But the CCMVal group corrected this in CCMVal-2, and the model runs began in 1960. I realize that many authors use 1980 (still), but 1960 is a much better choice. Also, by using 1980, it makes the

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uncertainty look smaller (compare Figs 1 & 2). More generally, I would like to see a brief discussion that explains that the ozone layer will not return to what it was in the past, because climate is changing.

Chapter 9 of CCMVal used additive noise models to fit smooth curves to the ozone data. Yet here the methodology has regressed to ad hoc methods. I would like to see the curves fit as in CCMVal Chapter 9.

There may be reasons for not doing this (and I don't mind being told why), but I would expect that a lot can be learned about model uncertainties from the past 1960-2010 period. There is not scenario uncertainty. Just model uncertainty and internal variability.

I would like to clarify a point. Does the term “internal variability” really refer to the uncertainty of how the real atmosphere evolves? If it were possible to rerun (an ensemble) of the real atmosphere from 1960, there would be a spread (discounting the possibility that the universe is deterministic). The observations represent just one curve. In this paper, “internal variability” is couched as a property of the models. This would be an excellent opportunity to discuss this topic, which is rarely described in papers.

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