

Interactive comment on “Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organisation” by V. Eyring et al.

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Reply to Alistair Sellar

Thanks Alistair for the helpful comments. We have now revised our manuscript in light of these and the other comments we have received. A pointwise reply is given below.

Most of these comments are concerned with making the design specification more explicit and removing ambiguity which could lead to avoidable

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differences between models. Thanks to Martin Andrews for one of the comments.

A general point for all experiments is to state the start and end date, not just the year. Should all experiments begin on 1st January of a given year? All experiments should continue until at least December of the end year. A lack of clarity here caused problems for HadGEM2 data submissions in CMIP5.

Thanks for pointing this out. We have added a sentence to the caption of Table 2 “All experiments are started on 1 January and end at 31 December of the specified years.” that clarifies this point.

p10550 line 18 “...a prescribed CO₂ concentration and a prescribed emissions simulation (accounting explicitly for fossil fuel combustion), in which concentrations are then “predicted” by the model...” For absolute clarity (though it makes it more repetitive), it would be worth inserting “CO₂” again before “emissions” and “concentrations” and stating that the treatment of other GHGs should be identical in both simulations.

Changed as suggested.

p10561 line 8: “The it piControl used in CMIP begins at this point and generally continues for at least a few hundred years.” There is a more precise statement about the it piControl length on the following page. Suggest dropping the second half of this sentence.

Sentence deleted.

p10563 line 2: “With that understanding, here are the recommendations for

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the imposed conditions on the it piControl ” Suggest “spin-up and it piControl”.

Changed as suggested.

p10563 line 15: “Models without interactive ozone chemistry should specify ozone as in the mean of the first decade of the CMIP Historical Simulation” Suggest aligning the ozone meaning period with the solar meaning period for consistency, even if it doesn’t make a significant difference.

The Chemistry-Climate Model Initiative (CCMI) indeed followed as similar approach as that suggested by the reviewer. The text is now more explicit: ‘Models without interactive ozone chemistry should specify the pre-industrial ozone fields from the corresponding dataset, which is produced from a pre-industrial control simulation that uses 1850 emissions and a mean solar forcing averaged over solar cycles 8-10, representative of the mean mid-19th century solar forcing.’

p10564 line 1: “The forcing specified in the it piControl also has implications for simulations of the future, when solar variability and volcanic activity will continue to exist, but at unknown levels. These issues need to be borne in mind when designing and evaluating future scenarios, as a failure to include volcanic forcing in the future will cause future warming and sea-level rise to be over-estimated relative to a it piControl experiment in which a non-zero volcanic forcing is specified. This could be addressed by re-introducing the mean volcanic forcing for the it piControl into the scenarios.” I would make this statement stronger and state at the very least that ScenarioMIP *will* use a time-constant non-zero volcanic forcing. I presume that this known already.

Changed as suggested.

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