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Interactive comment on "The Model Intercomparison Project on the climatic response to Volcanic forcing (VolMIP): Experimental design and forcing input data" *by* Davide Zanchettin et al.

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Comments from CMIP Panel

The CMIP Panel is undertaking a review of the CMIP6 GMD special issue papers to ensure a level of consistency among the invited contributions, also in answering the key questions that were outlined in our request to submit a paper to all co-chairs of CMIP6-Endorsed MIPs. We very much welcome the important contribution from VolMIP to the CMIP6 special issue, below are a few comments:

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Thanks for changing the title to include CMIP6 *'"The Model Intercomparison Project on the climatic response to Volcanic forcing (VolMIP): Experimental design and forcing input data for CMIP6"*. We agree no version numbering is required.

The relation to the standard forcing dataset provided for the CMIP6 historical simulations (see $ftp://iacftp.ethz.ch/pub_read/luo/CMIP6/$) is somehow unclear. The standard forcing dataset for stratospheric aerosol data include the following quantities: 1) sad: surface area density; 2) rmean: mean radius (required for some heterogonous reactions); 3) volume density: aerosol volume density; 4) H2SO4 mass. In addition, the models require model-tailored optical properties for the radiative transfer parametrizations (e.g., extinction coefficient, single scattering albedo, asymmetry parameter for the different bands, and AOD). Again these are provided for all participating CMIP6 models. What are the exact parameters that will be provided for the additional VolMIP forcing datasets? Are the methods to include the additional forcing datasets exactly the same or is a different approach required in the models to implement the additional VolMIP forcings? Please clarify and coordinate with the team who is providing the standard CMIP6 forcings.

When the proposed model EVA is used to produce the additional VolMIP forcings for the Pinatubo eruption, how do the results compare to the standard CMIP6 standard dataset? Please comment.

Any specification how to apply the additional forcing datasets with respect to the tropopause in each model?

The data availability section should be revised. The details on the WIP contribution are already included in the CMIP6 overview and can be deleted here. However, in order to

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run the experiments in VolMIP, other forcings that are developed for the CMIP DECK and the CMIP6 historical simulations are required. Therefore please expand the data availability section to refer to these forcings, e.g. *'"In order to run the experiments, data sets for natural and anthropogenic forcings defined for the DECK and the CMIP6 historical simulations are required. These forcing data sets are described in separate invited contributions to this special issue. In addition, specific volcanic forcings are required for the VolMIP experiments that are described in this paper. All forcing data sets will be made available through the ESGF with version control and DOIs assigned."*

Please ensure consistency of the experiment short name and other abbreviations with the CMIP6 overview paper (see Table 2 of Eyring et al., 2016) (e.g. *'piControl* for the pre-industrial control experiment).

Please ensure consistency with the final abbreviations of the CMIP6-Endosed MIPs (see Table 3 of Eyring et al., 2016) (e.g. DynVarMIP instead of DynVar).

Line 319ff: *'"VolMIP has defined a new group of variables (Volcanic Instantaneous Radiative Forcing, or VIRF, see Table 4), which includes additional variables that were not in the original set provided by CMIP and are necessary to generate the volcanic forcing in some experiments."* Please specify for which experiments these additional group of variables is requested, in particular whether this group is only requested for all or a subset of the VolMIP experiments, or also for the DECK and the CMIP6 historical simulations.

Line 320: we suggest to replace *'"were not included in the original set provided by CMIP"* with ' *'"were not included in the CMIP5 data request"*

Line 327: we suggest to repeat the actual parameters that are provided with the standard forcing dataset for the CMIP6 historical simulation here

Lines 362/363: can the parameters that are provided by EVA be given? How do they differ from the standard forcing dataset? See also the comments above.

References:

Eyring, V., Bony, S., Meehl, G. A., Senior, C. A., Stevens, B., Stouffer, R. J., and Taylor, K. E.: Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organization, Geosci. Model Dev., 9, 1937-1958, doi:10.5194/gmd-9-1937-2016, 2016.

With many thanks for your ongoing efforts in the CMIP6 process.

The CMIP Panel

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