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Interactive comment on "PMIP4-CMIP6: the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6" *by* Masa Kageyama et al.

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In response to my previous comment which highlighted the problem of citing un-submitted works, the authors elected to put this manuscript on hold until those manuscripts were submitted to GMD. Those manuscripts are now almost complete, and the authors have enabled me to see two out of the three of them for approval before submitting to GMD.

I find there is a real problem, which is that these two draft manuscripts both contain substantial discussion of the background and rationale behind the *CMIP6* PMIP4 protocols. These discussions are too entwined with the non-CMIP6 experiments within PMIP4 to be removed from those draft papers, and including the content within this

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Discussion paper

overview manuscript under consideration would be entirely impractical.

In terms of the peer review at GMD I find it unacceptable that we should in this overview manuscript be approving the protocols for the CMIP6 runs without first reading the rationale behind them!

All this suggests that the complete protocols should be peer reviewed within those other papers. Since those papers describe the rationale behind the CMIP6 protocols they must also be included in the CMIP6 special issue.

As for the present paper under consideration, a purely descriptive paper about PMIP does not fit into the peer review criteria and I have great difficulty accepting it as a standalone paper. However, if it were presented as the introductory part of a multi-part paper, I think it will be a useful contribution to the whole. This has led me to come up with a solution that solves all these problems, and I think it also produces a nice final product. I suggest that the papers be submitted as 4 parts of a multi-part paper. The titles should be made consistent with each other and include the Part number in the title. They do not have to be exactly this, but something like this would work...

PMIP4-CMIP6, the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6, Part 1: Introduction and(/or?) Overview

PMIP4-CMIP6, the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6, Part 2: Eemian and midHolocene

PMIP4-CMIP6, the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6, Part 3: The Last Millennium

PMIP4-CMIP6, the contribution of the Paleoclimate Modelling Intercomparison Project to CMIP6, Part 3: The Last Glacial Maximum

From the point of view of this paper, the authors are welcome to submit a revised version, but if outline protocols for the experiments are included then the final publication will need to wait until all the other three papers are accepted.

I appreciate the difficulties the authors have had with trying to write a single coherent paper as a contribution to the GMD CMIP6 special issue, but I think it was an intractable problem, because the resulting paper could not pass the GMD peer review criteria of including both the rationale and the protocols. In that context, I'd like to contrast this MIP with one of the others I edited. CFMIP have a huge number of experiments fully described within their paper, including tier 1 and tier 2 experiments. I think it is an elegant paper. However, CFMIP experiments are all highly idealised, and thus there is no great debate to be had in defining the protocols and they can be very simply described. PMIP, on the other hand is trying to model real and disparate intervals in the earth's climate history. This is an order of magnitude more complex, involving several different communities of scientists, and it so it is not appropriate to squeeze it all into a single paper. The multi-part paper will enable these communities to each take the responsibility for the defence of their own experiment protocols.

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