Response to Interactive comment on by H. Shiogama on "The Cloud Feedback Model Intercomparison Project (CFMIP) contribution to CMIP6" by Mark J. Webb et al.

Reviewer comments below are shown in bold and our responses are in italics.

Dear Hideo,

This paper provides a clear description of the design of CFMIP3/CMIP6. The proposed experiments and outputs are interesting and will be important contributions to CMIP6. I have only a few minor comments.

Thank you for your careful consideration of our manuscript and for these helpful comments.

I assume that all the CFMIP experiments are CO2 concentration driven. Should ESMs turn off dynamic vegetation and chemistry schemes?

The CFMIP experiments are indeed driven by CO2 concentration rather than CO2 emissions. Many of the CFMIP experiments are based on the DECK experiments (e.g. amip, piControl, abrupt-4xCO2). Experiments such as amip-p4K and abrupt-2xCO2 should be configured consistently with the DECK experiments that they are based on.

We will add additional text in the 2nd line of Section 2 as follows:

"Most of the CFMIP-3 experiments are based on CO_2 concentration forced amip, piControl and abrupt-4xCO2 CMIP DECK (Diagnostic, Evaluation and Characterization of Klima) experiments (Eyring et al., 2016). Unless otherwise specified below, the CFMIP-3 experiments should be configured consistently with the DECK experiments on which they are based, using consistent model formulation, and forcings and boundary conditions as specified by Eyring et al., 2016."

Line 213 "Sea ice and SSTs under sea ice remain the same as in the amip DECK experiment.": How should we set SSTs in grids with 50% concentration of sea ice?

We will modify this text as follows:

"Sea ice and SSTs in grid boxes containing sea ice remain the same as in the amip DECK experiment."

Line 263 "As such we hope that these experiments will provide useful synergies with Palaeoclimate Model Intercomparision Project (PMIP)": If there are any experiments that are directly related to the CFMIP experiments, please specify.

We will modify this text as follows:

"As such we hope that these experiments will provide useful synergies with the Palaeoclimate Model Intercomparision Project (PMIP) CMIP6 experiments (e.g. in interpreting differing cloud feedbacks

between future CO$_2$ forced experiments and those representing the Last Glacial Maximum, as highlighted by Yoshimori et al., 2009)."

Line 302 "cloud-radiative effects are switched off in the longwave part of the radiation code": Is the shortwave part retained?

We will modify this text as follows:

"cloud-radiative effects are switched off in the longwave part of the radiation code while retaining those in the shortwave."

2.4 Abrupt +/-4% solar forced runs: Not only TSI but also spectral solar irradiance (SSI) are provided for CMIP6 (http://solarisheppa.geomar.de/cmip6). I assume that many ESMs use the SSI data for their DECK experiments. How to add +/-4% solar forcing on SSI?

We will add a line to section 2.4 which states:

" When changing the solar constant, the shape of the spectral solar irradiance distribution should remain consistent with that in the piControl experiment."

Line 411 piSST: Do we use the monthly mean values of each year of piControl? Monthly mean climatology would lead to better S/N.

We will add the following to Section 2.7

"These are forced with monthly- and annually-varying monthly mean SSTs and sea ice, which reproduce regional precipitation patterns more accurately than is possible using climatological SST forcing."

Line 550 "allowing a detailed evaluation clouds": allowing a detailed evaluation of clouds?

We will correct that.