We would like to thank the reviewer for the supportive and helpful comments to improve our manuscript. Below we address the reviewer's comments in detail.

Comments from the Reviewer

- The reviewer suggested us to include some descriptions about the link between the developments presented in the manuscript and the tuning of the whole climate model

We added a new subsection that briefly describes tuning issues as follows.

3.11 Comments on tuning

At the end of this section, we give a brief description of the model tuning related to clouds. At a stage of developing schemes, a number of amip type simulations (with typical one-year length) were performed using atmospheric and aerosol coupled model, to check the basic behavior of schemes and the basic impacts on radiative fluxes. At a tuning stage, five-year runs of amip type simulations were mainly examined. The main targets for tuning parameters related to clouds in MRI-ESM2 were global-mean biases and root-mean square errors of shortwave and longwave radiative fluxes at the top of the atmosphere. The tuning parameters related to clouds are parameters which affect differently by cloud types and control cloud properties such as cloud cover, cloud water content, and cloud number concentration. In the stratocumulus parameterization (Section 3.1), the threshold value of ECTEI was tuned to increase Southern Ocean clouds as described in Section 4.1.3. The relatively large mode radius of sulfate of 0.10 µm (possible range: 0.05 − 0.10 µm) was chosen to obtain smaller cloud droplet number concentration to prevent an excessive aerosol-cloud interaction. Treatment of the WBF effect (Section 3.2), cloud overlap scheme (Section 3.5), schemes for ice sedimentation and ice conversion to snow (Section 3.9), and others (Sections 3.3, 3.4, 3.6, and 3.7) were not tuned. Descriptions of the model tuning (other than cloud-related parameters) are given in Yukimoto et al. (2019).

In addition, the possible range of ECTEI (−3.0 − +3.0 K) was specified in the first

paragraph in Section 4.1.3.

- Minor comment: please specify the unit of the variables in section 4.2.1

It is true that the unit in the section is important information for readers, as the reviewer pointed out. Thank you. The unit was specified.