

Reply to comments

I sincerely appreciate your valuable suggestions. Based on your comments, we incorporated the recommended revisions into our manuscript. The changes are highlighted in blue in the revised manuscript.

[General Comment]

I would like to thank the authors for addressing most of the concerns raised. I just have a couple of minor issues/suggestions that can be incorporated.

Comment 1: Regarding Reviewer1 Comment2: In section 3.1.1, there is an "...", the authors point to the EXP_cl and EXP_cl_br lines in Fig. R1, but I do not see those lines in the figure.

Reply: We apologize for the confusion caused by the inconsistent labelling. In Fig. R1, EXP_{Cl} and EXP_{Cl_Br} are shown as green and yellow lines, respectively, together with the results from CTRL, EXP_{CMAQ}, and observations. We revised the Fig. R1 to ensure that all labels are accurate and clearly correspond to the experimental cases.

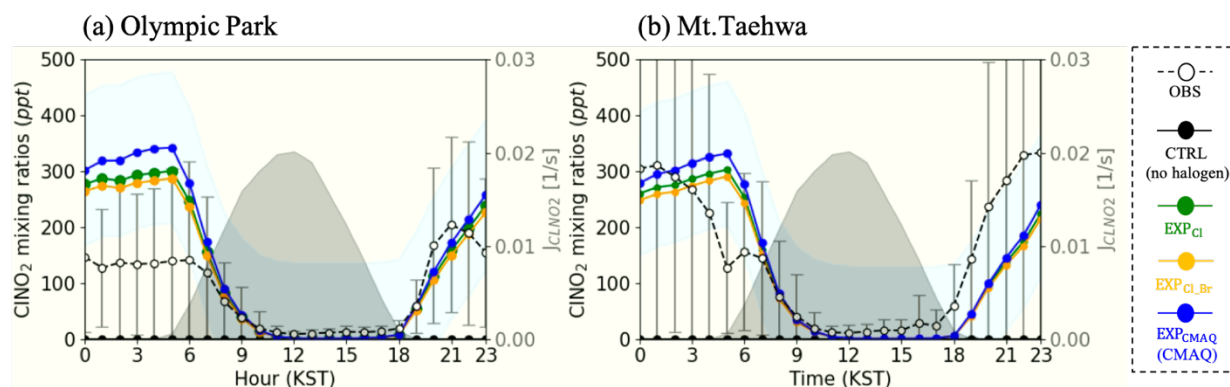


Figure R1. Diurnal variations in the mixing ratios of ClNO_2 (unit: ppt) at (a) Olympic Park and (b) Mt. Taehwa stations during the period of the KORUS-AQ campaign. Observed values are represented by open circles (error bars indicate the standard deviation). Colored lines with shaded areas show the hourly-averaged mixing ratios of ClNO_2 and the corresponding standard deviation from each simulation. The black shaded area indicates the variations in the photolysis rate of ClNO_2 derived from the EXP_{Cl_Br} simulation

Comment 2: Regarding the point of using EXP_CAM from Saiz-Lopez et al., 2014 - it might be worth adding a line that newer versions of the model do exist that account for the HCl and ClNO_2 production - with the reference. That way, the reader is fully aware that that model has also been updated since.

Reply: We added a sentence to clarify that more recent version of the model (please, refer to lines 347-348), along with the relevant reference.

Comment 3: The authors could consider adding a line or two on the ranges of mixing ratios and reactions rates that were perturbed for the sensitivity tests.

Reply: Thank you for your suggestions. However, we believe that Table S2 provides the ranges of reaction rates used in the sensitivity test.

Comment 4: This is very minor, but I noticed the authors changed HOCl in Table 3 (2?) to H0Cl. If so, then there are other variables in the table that need to be changed as well such as HOBr (r8) and HOI (r15). And in Table 4 (3?).

Reply: To clarify, it is noted that the character ‘O’ in HOCl in Table 2 was not incorrectly written as the number ‘0’; rather, it was a matter of font style. Accordingly, we have unified the font style and applied the same formatting to Tables 2 and 3.