

Responses in Red

Corrected text in blue

Comments by Referee #2

The authors have responded to all of the reviewers' comments on the manuscript and have revised it to accommodate many of the reviewers' suggestions. The revised manuscript adapts clearer explanation in some places, but some issues still remain. In particular, the inconsistencies between numbers in the text and in tables, and the inconsistencies in significant digits, which were pointed out by the reviewers in the first draft, are still present. Although the authors state in their response that they have addressed these issues, I believe that further and more careful confirmation of consistency is necessary before the manuscript can be published in ACP. Below are some of the improvements I have noticed that need to be made (Note that the line numbers are based on egusphere-2024-432-ATC1.pdf)

We thank the referee for meticulously reading through our revised manuscript and recommending corrections.

L223-228: Figures should be revised.

L235: 4.16TgN/yr² <-- Number is different from Table3

L255: effective source of methane --> effective source of RC

L256: 437TgC/yr --> 438TgC/yr

L288: 6.78% --> 7.11%

L289: NO_x emission --> RC emission

L290: 6.45% --> 6.76%

L292: NO_x emission --> RC emission

L311-312: Why did you choose the different significant digit for NO_x-tagged (91.5 TgO₃) and RC-tagged simulation (76 TgO₃)? This sort of inconsistent use of significant digits can be found throughout the manuscript.

L332: 116 TgO₃ --> 117 TgO₃

L333: 23 TgO₃ --> 24 TgO₃

L361: Figure S6 --> Figure S5

L435: Table S5 --> Table S7

L516: 0.48% --> 0.54%

L524: 22-27% --> 24-29%

L591: 24% --> 25%

We have now incorporated all the corrections as suggested above. We have also corrected a few additional misquotes that weren't included in the comments by the referee. Please refer to the document with tracked changes.

However, for lines 289 and 292, we retain “NO_x emission”, as we were trying to refer to the similar feature in the NO_x emission time-series. To avoid confusion by readers, we replace “as for” with “similar to”. The last paragraph in section 3.1.2 after the corrections is now:

Among the anthropogenic NMRC emissions, East Asian emissions are the largest (~95.4 TgC/yr (7.11 %); Table 4), increasing at 3.54 TgC/yr² peaking in 2011 and decreasing after that at -2.82 TgC/yr²(Fig. 3(d); Table S6), a feature similar to the NO_x emissions. Second largest emitter is the “Rest of the World” region (~90.8 TgC/yr (6.76 %); Table 4), with an increasing trend of high certainty (Fig. 3 (d)). Remaining regions each contribute to less than 5 % of reactive carbon emissions. South Asian, Middle Eastern, and ship NMRC emissions show an increasing trend, and North American, European, Russia-Belarus-Ukraine region's NMRC emissions show a decreasing trend (Fig. 3 (d); similar sign of trend also seen for anthropogenic NO_x emissions). We also see an equatorward shift in global anthropogenic NMRC emissions, similar to the anthropogenic NO_x emissions in our zonal sum profiles of deviation in anthropogenic NMRC from year 2000 (Fig. S4b).

L311-312: Why did you choose the different significant digit for NO_x-tagged (91.5 TgO₃) and RC-tagged simulation (76 TgO₃)? This sort of inconsistent use of significant digits can be found throughout the manuscript.

We have now used a consistent number of significant digits not only in the Tables but also in several other places while quoting numbers in the manuscript text. After these corrections, the quoted numbers in the manuscript have either mostly 2 or max 3 significant figures, also with consistent number of significant figures while comparing them especially within a single sentence. Additionally, we also made sure that the tilde (~) symbol is included wherever rounding is done for the sake of reducing the significant figures in the quoted text.

Our choice of the number of significant figures for a given quantity is dependent on the extent to which it can be compared with other quantities. While quoting them in the manuscript text, we tend to round it off to the nearest digit for the sake of readers' convenience while also not distorting the meaningfulness of the discussion.

Apart from this, we also found a few missing references in the References section. We now include them in this revision.