Authors Response

Dear Mrs Khosrawi,

we would like to thank you very much for the list of technical improvements. Below you find your list with improvements. If the font is green we applied the improvements as suggested. Please that this applies to nearly all suggestions with some exceptions mostly related to abbreviations. Please do not hesitate to contact us again, if we misunderstood the suggestions regarding the abbreviations. Our answers are given in *blue below your suggestion*.

Yours sincerely,

Johannes Pletzer

Editor comments on revised version of egusphere-2022-285

Pletzer et al.: The Climate Impact of Hydrogen Powered Hypersonic Transport

P2, L49: I would suggest to write "given by Grewe et al. (2010)" instead of "given in 2010 by Grewe et al."

P2, L49-50: This sentence is not really helpful. Add the references directly after the given numbers instead of having an additional sentence stating where you get these numbers from. Or if it is better to use two sentences for clarity then add these numbers to the second sentence.

P2, L59: "Polar dehydration within polar stratospheric clouds" sounds quite weird. Write "Polar dehydration caused by the sedimentation of polar stratospheric cloud particles……."

P3, L73: The "2" should be in subscript.

P3, L76: Same here for NOx. The x should be in subscript. This should be adjusted throughout the manuscript.

P3, L88: Move "yet" one line up and put it behind "not", so that it reads "not yet been assessed".

P3, L88: Move "as well" behind "remains"

P3, L91: add "the" so that it reads "on the impact" and add "atmospheric composition" or "stratospheric composition".

P3, L92: Move "flying at 30 km" at the end of the sentence and add "altitude" so that it reads "flying at 30 km altitude".

P4, L95: Add "the" -> "They focus on the sensitivity"

P4, L96: of -> in ? (Not sure which is correct, please check)

> Thank you for pointing that out. "for" is the correct choice. Now: "Their estimate for a reduction"

P4, L99: Abbreviation RF has not introduced yet.

> The term RF was introduced in line 46. We happily add another introduction, if needed.

P4, L108: Abbreviation “LAPCAT” and “PREPHA-type” has not been introduced. Further, the latter should be written in upright font.

The term LAPCAT was introduced in line 92. We further added the long term for PREPHA, which is “Programme de REcherche et de technologie sur la Propulsion Hypersonique Avancée”

P4, L114: section 4 -> Sect. 4, section 5 -> Sect. 5, section 6 -> Sect. 6 (use the Copernicus style)

P6, L147: Abbreviation MIPAS not introduced.

P6, L148-149: mode -> model? Anyway this is obsolete and should be deleted. Instead of “setup” it should rather read “tool”.

P6, L157: Abbreviation ECHAM not introduced.

The abbreviation was introduced in line

110-111

P6, L159: Abbreviation ECMWF not introduced.

P7, L176: Add “were” so that it reads “chemistry calculations were operated”.

P7, L180: Add “to“ so that it reads “and to alter specific humidity”.

P7, L184: Add the link to the MESSy webpage and/or a reference to the latest version of the model.

Added hyperlink to MESSy homepage

P9, L239: Write STS and NAT rather than type I and type II since you are not explaining the different types. Write also what STS and NAT stands for and add the respective compositions.

P9, L240: write “includes sedimentation of the PSC particles and combine with the next sentence and continue with “which affect…….”

P8, L252: Introduce the abbreviation ORCHIDEE and use and an upright font for ORCHIDEE.

ORCHIDEE is now upright. The abbreviation was introduced in line 125.

P9, 259: Add trace gases “long lifetimes of trace gases in the stratosphere”.

P9, L260ff: There are a lot of abbreviation that have not been introduced: IPCC, CMIP6, SSP, RCP CMIP5, SSP3-7.0.

General comment: The model description is quite long. You could consider to shorten it.

Thank you for the proposition. We get your point and would like to keep the full

description in the manuscript.

P11, L284: PREHA in upright font.

P12, Figure 2: Increase figure size.

P13, L317: section 5 -> Sect. 5

P14, L329: Abbreviation UTLS has not been introduced.

P15, L336: move the reference of Cohen behind “software”.

P16, L372: Write instead of just sedimentation “sedimentation of particles” or “sedimenting particles”

P16, L373: resolved -> considered?

P18, R1: Use “Eq. 1” instead of “R1” (Thus use the Copernicus style) and use upright font for the chemical reactions.

P19, L416: Two “2” in H2 should be in subscript.

P19, L418: Same here for the “x” in HOx

P20, L419: use here the chemical abbreviations since you already have introduced them.

P23, L463: Add “(RF)” after “radiative forcing”.

P23, L465ff and P24, L490ff: units should be written in an upright font.

P25, L524: considerabe -> considerable

P27, L576: Sect. 7.3 title Emission should read Emissions.

P28, L583: add “the” -> than “the” EMAC

P28, L591: Put numbers in subscript.

P28, L595: PREHA in upright font.

P29, L631: Add here the altitude in parenthesis once again.

P29, L631ff: “x” should be in subscript.

P30, L636: in -> at (thus it should read “at lower stratospheric altitudes”.

Appendix.: Consider combining figure A6-A9 to one figure.

We combined Figures A6, A7 and A8, A9 as pairs, since all combined were too large for one page.