

#Reviewer 3

General Comments

Overall, this is an interesting study that adds insight into the role that typhoons and mesoscale convective systems play in transporting stratospheric ozone to the surface. The science of this study is sound, the paper is well organized, and the figures nicely complement the text. However, there is poor grammar throughout the paper which makes it difficult to read at times. I include specific comments below that address many of these grammatical errors. My comments below are mainly minor in scope. As a result, I fully support acceptance of this paper once the following comments are addressed. I think this paper will be a good addition to the ACP journal.

We appreciate the reviewer's time and efforts to improve the language and quality of the paper. We have revised the manuscript thoroughly according to the comments and the manuscript has been improved substantially. The point-to-point responses are listed below.

General Comments

You should add a table that lists basic parameters you used for your WRF simulation. This is standard practice when running a model simulation.

Thank you for pointing this out. A table of basic WRF settings has been added in Section 2.3

You should capitalize "Typhoon" since you are referring to a specific one by name. You should do this throughout the paper anytime you reference "Typhoon In-fa".

Thank you very much. Corrected and checked throughout the manuscript.

Be consistent with how you refer to water “vapor”. You go back and forth between “vapor” and “vapour” throughout the paper. These are both correct so select one and stick with it.

Thank you for pointing out this problem, we have corrected these mistakes throughout the manuscript.

Make sure to include articles like “a” and “the” before referring to a singular noun. I did my best to address some of these specific instances below but I did not discuss all of them below.

Thank you so much. We appreciate your kindness and efforts to improve the quality of this paper.

Spell out “Figure” if it begins a sentence.

Thank you so much. We learned a lot from your suggestions.

Specific Comments

Line 14 – Change “...at night...” to “...during the night...”

Corrected.

Line 16 – Provide the time units (LT or UTC) for 23:00 and 6:00

Added in the manuscript.

Line 16 – Change “01 August, 2021” to “1 August 2021”. There are other instances of this throughout the paper so fix date formats accordingly.

Corrected throughout the manuscript.

Line 19 – Change “...of...” to “...of a...”

Corrected.

Lines 20-21 – Reword this sentence. You make a good point, but this is lost here because of grammar issues.

Thank you for your suggestion, we have modified the sentence.

Lines 23,66 – You should define the MCS acronym as MCSs because you refer to “systems” which is plural. Once this is defined then you can use “MCS” in the future when referring to just a single mesoscale convective system.

Thank you for point out this problem. We have modified them throughout the manuscript.

Line 26 – Change to “...still bring down a stratospheric...”

Corrected throughout the manuscript.

Line 28 – Change “pre-existed” to “pre-existing”

Corrected throughout the manuscript.

Line 29 – Change “descending” to “descent”

Corrected throughout the manuscript.

Line 39 – Change to “...contains only 5-10% of atmospheric ozone, as well as high water vapor and CO concentrations due...”

Corrected.

Line 43 – Be careful here. You refer to deep convection which is singular but then you use “they” later in the sentence. Be consistent with your grammar.

Thank you for pointing this out. We have modified the sentence.

Line 48 – Change to “...in the UTLS.”

Modified.

Line 51 – Change to “...from the ABL to the UTLS...”

Modified.

Line 53 – Change to “...for the radiation balance...”

Corrected.

Line 58-62 – This sentence is too long. I suggest breaking this up into two separate sentences.

Thank you for your suggestion, we have modified the long sentence in the manuscript.

Line 80 – Change “Compare” to “Compared” since the comparison occurred in the past tense.

Corrected.

Line 82 – Change to “Such a significant...”

Corrected.

Line 85 – Change “...in 2021 summer...” to “...in Summer 2021.”

Corrected.

Line 90 – Replace “unneglectable” with a better word here

We changed “unneglectable” to “substantial” in the manuscript.

Line 91 – Use a singular verb “was” instead of “were” when referring to the MCS event

Modified in the manuscript.

Line 95 – Change “descend” to “descends”

Corrected.

Line 120 – Should read “...by the Institute of Atmospheric...”

Corrected.

Line 123 – Avoid starting a sentence with O3. Spell this out instead.

Modified.

Line 128- You discuss numerous acronyms here without defining them beforehand – this includes AIRS, EOS, OMI, etc.

Sorry for these mistakes. We have added the definitions of these acronyms.

Line 170 – Change to “guarantees”

Corrected.

Line 171 – Change to “To explicitly...”

Corrected.

Line 180 - Change to “Covering the entire lifespan of the MCS...”

Corrected.

Line 190 – Change “...would be described...” to “...is described...”

Corrected.

Line 201 – What does the squiggly line mean between 45 and 50? Is this a range? If so, change this to a dash.

Corrected.

Lines 204-205 – Change “...normal diurnal cycles since...” to “...subsequent diurnal cycles...”

Corrected.

Line 210 – Use a better word than “severer”

Thank you for this suggestion, we have deleted this sentence according to the reviewer’s suggestion.

Line 224 – Change “...and MCS took place...” to “...during the MCS event...”

Modified.

Line 225 – Change to “...in cities such as...”

Modified.

Lines 234-235 – I suggest rewriting this sentence. Using words like “well revealed” or “averagely” sound awkward.

Thank you for your suggestion. We have rephrased the sentence.

Line 237 – Change to “the SHATLE...”

Corrected throughout the manuscript.

Line 237 – Define the acronym SHATLE for the reader here.

Sorry for this, the acronym SHATLE was defined in Line 120.

Line 244 – Change “continuously” to “continuous”

Corrected.

Line 245 – Change to “...in the next 10 minutes and remained high for the next eight hours.”

Corrected.

Line 270 – remove “originated”

Corrected.

Line 273 – “typhoon” should be plural

Changed, and checked throughout the manuscript.

Line 277 – Change “While in this case study...” to something simpler like “In this study...”

Modified.

Line 278 – Refer to the storm as “Typhoon In-fa”

Thank you, we have modified the expression throughout the manuscript.

Line 293 – Change to “...even though In-fa was in its dissipation stage.”

Thank you, we have modified the expression throughout the manuscript.

Line 303 – refer to “suggest” in the present tense

Corrected.

Line 308-311 – Break this up into more than one sentence.

Thank you for your suggestion. We have modified the long sentence.

Line 312-315 – Break this up into more than one sentence.

Thank you. We have modified the long sentence.

Line 345 – Change “descending” to “descent”

Corrected and checked throughout the manuscript.

Line 346 – Refer to dates with the proper format

Thank you. Corrected and checked throughout the manuscript.

Line 348 – Change “...located at southwest...” to “...located southwest...”

Corrected.

Line 350 – Change to “...evolved into a bow-echo MCS....”

Corrected.

Lines 354-356 – Clean this sentence up. I do not understand what you are trying to say.

Sorry for this. We have modified the expression.

Line 368 – Change “...that located...” to just “located”

Corrected.

Line 375 – Change “...of thunderstorm...” to “...of a thunderstorm...”

Thank you. Modified in the manuscript.

Line 382 – Change “descending” to “descent”

Corrected.

Line 387 – Explain what you mean by overforecasted convection distribution. Does this mean the model was too aggressive in developing convection? If so, state this more clearly.

Thank you. Compared with radar observations, the simulated convection distributes over larger regions, and hence we said WRF overforecasts the convection coverage in this case. Modified in Line 393-396.

Line 387 – Change “...well captures...” to “...does a good job capturing...”

Modified.

Figure 9 – Change caption from “...occurred in the night...” to “...occurred during the night...”

Corrected.

Line 402 – Change “descending” to “descent”

Corrected. Thank you.

Line 402-405 – Clean this entire sentence up. It is difficult to read.

Sorry for this. We have rephrased the long sentence.

Line 420 – Change “upper” to “up”

Corrected.

Line 423 – Change “descending” to “descent”

Corrected.

Line 436 – Change “dissipating” to “dissipation”

Corrected.

Line 445 – Change “perturbated” to “perturbed”

Corrected.

Line 446 – Change “pre-existed” to “pre-existing”

Thank you. Corrected.

Line 460 – Remove “relatively”

Removed.

Line 480 – Change “perturbate” to “perturb”

Corrected.

Line 483 – Change “descending” to “descent”

Corrected. Thank you.

Line 487 – What does “at the midnight” mean?

We changed “at the midnight” to “during the night”. Thank you for pointing this out.

Line 488 – Change “pre-existed” to “pre-existing”

Corrected.

Line 491 – Replace “rapider” with a better word

Thank you. We changed “rapider” to “faster”.

Line 500-502 - Clean this sentence up. It reads awkwardly.

Sorry for this. We have rephrased the long sentence.

Line 503 – Change “threatens” to “threats”

Corrected.

Line 505 – Change “...in the mechanisms...” to “...of the mechanisms...”

Corrected.

Line 689 – The Preston reference should list “Barth” as a coauthor (not Berth)

We are very sorry for this mistake. Corrected in the reference.

Figure 5 – The second sentence of this caption needs to be fixed – “...the last six track information...” does not make sense.

Thank you for pointing this out. The magenta crosses represent the tracks of Typhoon In-fa during its dissipation stage with a time interval of 6 hours. We have modified the caption.

Figure 7 – Include the year of the dates with this caption.

Added in the caption, thank you for pointing this out.

Figure 8 – Remove “occurred” in the caption

Removed.