Editor comments: You have addressed the referee comments satisfactorily in your response. However, some of these responses should be also added to the manuscript. In addition, I have some minor/technical comments that should be considered before final acceptance.

Main comments

1) Referee #3 had asked about reasons for the low NO_3 concentration predicted by M8. In the response, you wrote that NH_3 production is very low. However, in the manuscript, you only mention that the N_2O_5 hydrolysis is missing (l. 193). Please add here and/or at a different appropriate place also the lower NH_3 'production'. Please also clarify what you mean by this. I assume that you mean NH_3 emission ('production' would imply a chemical formation) that leads to ammonia, which in turn, then leads to enhanced NH_4NO_3 levels (?)

Response: Both NH_3 and NH_4^+ of M8 were lower than the other models according to Fig. 3 and Fig. S4 of Chen et al., 2019. It is very likely that M8 used low NH_3 emission, which led to less conversion of NH_3 to NH_4^+ and prevented the formation of NH_4NO_3.

We have modified the following sentences in lines 189-192:

"M7 and M8 models produced significantly lower NO_3^- concentrations than observations and other models, due to underestimation in NH_3 concentrations (might be caused by low NH_3 emission) and missing the N_2O_5 heterogeneous reaction that sever as an important formation pathway of NO_3^- (Chen et al., 2019)."

2) Finally in the last response to the referee report, you added an explanation why the M7 and M8 did not include sea-salt emission ('turned off by mistake'). Since both referees were puzzled why the models did not include these emissions, this information should be added (e.g. in line 305). It is completely acceptable to admit in a paper that mistakes were made in the model set-up.

Response: We modified the description about the sea-salt emission of M7 and M8 in line 309 as follows:

"In this study, the WRF-Chem models (M7 and M8) turned off the sea-salt emissions, thus their PMC concentrations over the oceans and seas are not defined."

3) In the last referee report, Reviewer #2 commented on the discussion in lines 397ff (in the most recent manuscript version). In the response to the referee, you gave some very brief explanation why you prefer comparing the wash-out ratio rather than comparing C(depo). Please expand on this explanation and add it to the manuscript.

Response: The two indicators: λ_{wet} and V_d were first mentioned in lines 133-148, where we introduced the mechanism of wet and dry deposition.

We added the following sentences in lines 401-408 to explain the reasons for using these two indicators instead of direct model outputs of wet and dry deposition.

"The amount of wet deposition is determined by the $C_{surface\_air}$ and λ_{wet} (mentioned in sec. 2.2). And in this study, $C_{surface\_air}$ may be partial influenced by different model inputs, caused by mismatch occurred in vertical and temporal allocation of emission inputs and employment of different mechanisms to produce dust and sea-salt emissions. Thus, we

used λ_{wet}, instead of direct model outputs of wet deposition, as an indicator to reveal the inter-model differences on wet deposition in the following analysis. For the same reason, we used V_d as an indicator for inter-model comparison on dry deposition."

4) In the last referee report, Reviewer #2 suggested that also uncertainties on OH and/or ozone concentration may lead to uncertainties in the predicted gas-aerosol conversion of S and N. Only in the conclusion section, you vaguely mention this possibility (l. 430 ff). Are there any previous model studies that discuss such uncertainties? In any case, possible uncertainties in the oxidant levels should already discussed earlier, in Section 3.2.
Response: We moved the discussion on the impacts of OH on gas-aerosol conversion of S and N from the conclusion section to sect. 3.2 (lines 288-293). We expanded the discussion and cited previous studies as follows:
Lines 288-293: "Besides the inter-model differences in the pathways of SO_4^{2-} and NO_3^- formation, the interaction between aerosols and atmospheric oxidants can also affect the formation of aerosols (Liao et al., 2003). Aerosols affect the tropospheric oxidants (i.e. HO_x) budget by altering the photolysis rates and uptake of reactive gases (Tie et al., 2003; Li et al., 2018). In turn, the abundance of HO_x affects the gas-aerosol conversion of S and N. In addition, the conversion between sulfuric acid and SO_4^{2-} depends on the abundance of neutralizers such as Na^+ and NH_4^+."

Minor/technical comments
Add units to all parameters used in the equations.
Response: We have added units to all parameters in the equations.

l. 29/30 and 41/42: This text is repetitive. Please reword or remove accordingly.
Response: We deleted the repetitive sentences in lines 41-42.

l. 132: 'Particles participate in the cloud condensation nuclei' should be reworded.
Response: We have reworded the sentence as follows:
"Particles take part in the cloud condensation nuclei"

l. 171: replace 'satisfied' by 'satisfying'
Response: We have replaced the words.

l. 174: replace 'intensively located' by 'concentrated'
Response: We have replaced the words.

l. 193: replace 'sever as an import formation process' by 'serve as an important formation process'
Response: We have replaced the words.

l. 212: replace 'process' by 'processes'
Response: We have replaced the words.

l. 212 and 214: replace 'group' by 'groups'

Response: We have replaced the words.

l. 213: replace ‘but’ by ‘a’
Response: We have replaced the words.

l. 283: ‘…the differences between the two are smaller’ – please clarify: smaller than what?
Response: We changed the sentence to “…the differences between the two in $C(NO_2)$ are smaller than those in *SOR.”*

l. 301: replace ‘comes’ by ‘come’
Response: We have replaced the words.

l. 366: replace ‘succeed’ by ‘succeeds’
Response: We have replaced the words.