

We have included a point-by-point response below for the minor revision requested. Green text is our response, blue text is existing text in the manuscript, and red text is text that has been changed based on our response.

The authors have made efforts to answer the reviewers concerns in a constructive way, improving the clarity of the paper.

One last minor comment regarding the choice of a 20% emission reduction for determining the regimes deserves a small justification. Please include it and we will then finalize this submission.

We have incorporated the explanation for the choice of reducing the emissions by 20% below in Section 2.2, just before Table 2 (Line 188):

“In each sensitivity simulation, the decrease of the precursor gas applied to all emissions sources (natural and anthropogenic). We chose a perturbation of 20% because it is in line with the model’s ability to capture changes in PN. Throughout the timeframe, GEOS-Chem captures wintertime PN trends well (see Section 2.5) through changes in NO_x and NH₃ emissions that span 20-50% (Figure S4), suggesting the model will be able to accurately capture the impacts of a 20% perturbation in emissions. Other analyses using this method similarly use 20% (Dang et al., 2023b; 2024).”

We also made some technical changes as requested by the editorial support team, specifically adding country affiliation and renumbering supplemental figures S.A, S.B, and S.C to S18, S19, and S20.