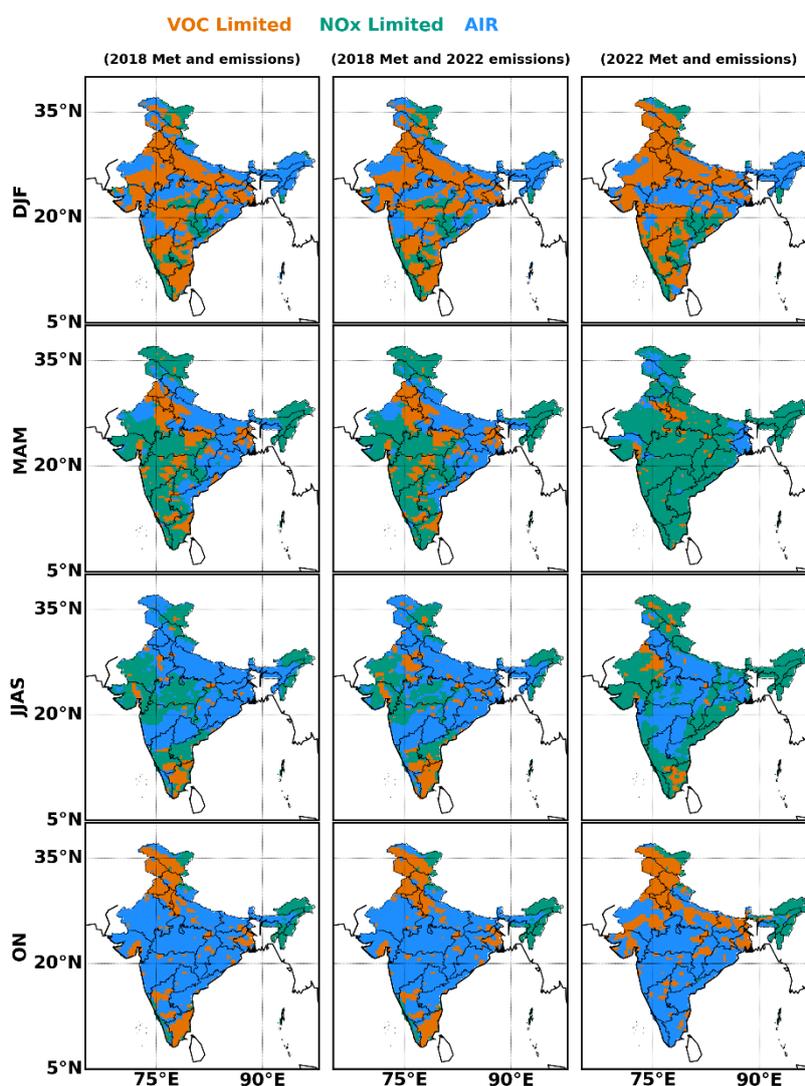


1 **RESPONSE TO EDITOR**

2 Thank you for your valuable time, effort and insightful comments. We have attended all
3 suggestions and revised the MS accordingly. The author's response below and revised parts
4 in MS are shown in **blue typeface**.

5 1) For Fig 6, please either change the red or green to a more color-blind friendly color to make
6 the figure more accessible to readers.

7 Done, to improve the visual discrimination and ensure colour-blind accessibility, we have
8 revised **Figure 6** using a **high-contrast, colour-blind-safe palette (orange–teal–blue)** for the
9 regime classification in the revised manuscript.



10

11 Figure 6: The regional distribution of various ozone generation photochemical regimes
12 modelled with γHO_2 of 0.2 in (left) 2018 and (right) 2022. Here, AIR is Aerosol Inhibited
13 Regions. Here, DJF is December-January-February, MAM is March-April-May, JJAS is June-July-
14 August-September and ON is October-November.

15 2) please look over these guidelines for writing the conclusions ([https://www.atmospheric-](https://www.atmospheric-chemistry-and-physics.net/policies/guidelines_for_authors.html)
16 [chemistry-and-physics.net/policies/guidelines_for_authors.html](https://www.atmospheric-chemistry-and-physics.net/policies/guidelines_for_authors.html)). Specifically,
17 comparison/context to prior studies and caveats/uncertainties.

18 The Conclusions have now been revised to include

19 (i) Comparison and context with prior observational and modelling studies, highlighting
20 consistencies and advances in understanding aerosol–ozone interactions

21 *“These results are consistent with previous observational and modelling studies over India and*
22 *other polluted regions, which have reported ozone suppression under high aerosol loading due*
23 *to reduced photolysis and enhanced heterogeneous radical loss, and ozone enhancement*
24 *following PM reductions under emission control measures, whereas this study advances*
25 *earlier work by providing a nationally coherent, seasonally resolved quantification of aerosol–*
26 *HO₂ uptake and meteorological influences on surface ozone.”*

27 (ii) A discussion of uncertainties related to emission inventories, heterogeneous chemistry
28 representation, model resolution and interannual meteorological variability. In addition, we
29 have clarified the broader implications of our findings for atmospheric behaviour and air
30 quality management under declining particulate matter conditions.

31 *“Uncertainties related to emission inventories, representation of heterogeneous chemistry,*
32 *model resolution and interannual meteorological variability may influence the magnitude of*
33 *the simulated responses, but do not affect the robustness of the identified mechanisms or the*
34 *relative importance of aerosol–chemistry–meteorology interactions. Therefore, this study*
35 *recommends the need for integrated air quality management strategies that consider both*
36 *aerosol and precursor emissions, along with regional meteorological patterns, to address*
37 *ozone pollution in India effectively, highlighting that future reductions in particulate pollution,*
38 *while beneficial for public health, may exacerbate surface ozone unless accompanied by*
39 *coordinated NO_x and VOC mitigation under evolving climatic conditions.”*

40

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42 REV3/V01/01012026
