

O₃ pollution over Indian subcontinent causes considerable losses in the crop productivity and affects human health leading also to pre-mature mortalities. Considering scarcity of in situ measurements in the region, manuscript by Hakim et al. presenting the comparison of ozone simulations among several models and with available observations is of great interest. Manuscript is recommended for publication in the Atmospheric Chemistry and Physics. Following comments and suggestions should be considered during the revision.

Comparison of model results are primarily made with urban / semi-urban environments. I agree with authors (Page 1, l:31–33 and Page 28, l: 8–10) that global models, due to coarse resolution could have limitation in reproducing local influences. It might be useful to also compare with recent observations considerably away from major anthropogenic influences, such as Nainital (Sarangi et al., 2014).

Why Delhi site is considered as semi-urban? where average values of NO_x up to 180 ppbv (Page:17, l:28–29) indicate strong anthropogenic influences. It is possibly better to classify this site as urban. In addition, in the text, a mention of O₃, CO, NO_x observational values should also be mentioned from other stations in Delhi (e.g. Sharma et al., 2016) (which would be within a grid box of global models). This would provide a more general range of NO_x bias over Delhi, which seems as of now very high (based on values at single location in the region of strongest variability).

Figure 4 and Page 13, l.10–13: This analysis is very useful and tells clearly over which regions models differed with each other, more strongly. The text “This is worse than.....Europe and North America” should include quantitative information on what are typical % standard deviations (or range) seen in MIPs over Europe and North America, for a ready reference here itself.

Page 14, l.9–10: “In all locations....than observations”. No, Jabalpur mean model values seem well within 1-sigma of the observed values. Check and modify the statement suitably.

Page 19, l.11–16: Pl. check for a consistency in this text. L.13 says that at Jabalpur correlation is poor, then it is said that “models show good correlation at all sites” in l.15.

Page 20, l.8–9: High levels of tropospheric ozone columns (TOC) are attributed to anthropogenic activities and biomass burning. While for surface ozone it could be the driver, tropospheric column ozone could have considerable contribution from long-range transport and Stratosphere-to-Troposphere Transport (STT) (see e. g. Ojha et al., 2017). I do not see any mention of these aspects here. Is it possible to further compare whether stratospheric contributions among models are similar to each other or they differ significantly? This could corroborate the finding (Page 21, l.2–4) that the CCMI-UKCA produces highest surface ozone but not the TOC, indicating potential influence of processes (other than regional emissions) affecting the inter-comparison of model TOC.

Page 24, Figure 13: Model simulations were said to be for period 2008–2010 (Abstract: Page 1, l.21). For comparison with CARBIC observations during 2008, why model data for 2010 is used (and not for same year 2008). Did I miss something here?

Minor comments:

Page 7, l. 22: delete “traditionally”; and consider changing “observation poor” to “observationally sparse”

Page 10, 1.1–4: The sentence should be reframed.

Page 16, 1.23 and Page 17, 1.13: “between models” to “among models”

Page 25, 1.9–10: This is not clear. Do you mean that model profiles over the Chennai airport are used for comparison? If yes then write so.

Page 25, 1.16–17: “The levels of CO ..are generally worse in comparison...”. consider rewording the sentence.

Page 25, 1.22: Correct “2010” to “2008”

Sincerely,

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References

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- Sarangi, T., Naja, M., Ojha, N., Kumar, R., Lal, S., Venkataramani, S., Kumar, A., Sagar, R., and Chandola, H. C. (2014), First simultaneous measurements of ozone, CO, and NOy at a high-altitude regional representative site in the central Himalayas, *J. Geophys. Res. Atmos.*, 119, 1592–1611, doi: 10.1002/2013JD020631.
- Sharma, A., Sharma, A. K., Rohtash, Mandal, T. K. (2016), Influence of ozone precursors and particulate matter on the variation of surface ozone at an urban site of Delhi, India, *Sustain. Environ. Res.*, <http://dx.doi.org/10.1016/j.serj.2015.10.001>.