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Atmospheric Chemistry and Physics Discussions

Interactive comment on "An assessment of the impact of a nation-wide lockdown on air pollution – a remote sensing perspective over India" *by* Mahesh Pathakoti et al.

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Dear Dr. Sayer,Thanks for your kind observations and constructive suggestions, which certainly helps us while improving the manuscript.

1.In the present study we have used MODIS level 3 aggregated daily product ÂăatÂ 1 degree resolution version 6.1 (MOD08_D3 v6.1 & MYD08_D3 v6.1)). However, it was wrongly written in the current manuscript. We shall correct resolution and product information along with its algorithm development in the revised manuscript. We greatly appreciate the observations and papers suggested for reference.ÂăÂ

2. During India's exhaustive lockdown (N=40 days), strict norms had been imposed on all the activities such as industries to shut down, transport sectors, closing of interstate borders and restricting the public movement except for essential needs. After May 4th 2020, lockdown in India has been relaxed in a phased manner. Hence, in the present study we considered only a strict lockdown period, which significantly depicts the influence of anthropogenic activities on air quality. ÂăAs you observed, we compared AOD and other parameters during the lockdown period in 2020 and equivalent period in 2019. Subsequently, we studied the effect of lockdown in 2020 in comparison with the last 5 years, to confirm whether the change is maintained in the last 5 years as well. However, we strongly consider your point because AOD has great variability with sources and local meteorology. We shall update the revised analysis with 10 year data.

3.Also as suggested, we shall explore the other data sources and metrics to improve the result of the study. ÂăWe shall provide all the supporting statistics to strengthens the results reported in the study. Thanks for the references provided.

4. As you are aware aerosols and air pollution together influences cloud properties and contributes to the changes in rainfall. Since India's exhaustive lockdown is just before monsoon, we are only anticipating the forthcoming monsoon may be better than previous year due to probable improvement in air quality. However, now as monsoon started in India, as you suggested we shall consider the supporting evidence and we will report the rainfall during 2019 and 2020. Kindly note India's serious lockdown was upto May 3rd 2020 with serious restriction on every sector and later it was relaxed in phased manner. Thus, this study reported only serious lockdown which makes a benchmark for understanding anthropogenic activities. As you suggested, we shall consider post-lockdown data and we shall compare these results as well in the revised work.

Once again thanks for your valuable comments and suggestions which will definitely help us to strengthen the work.

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