

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2021-495

Anonymous Referee #1

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Referee comment on "Changes in PM<sub>2.5</sub> concentrations and their sources in the US from 1990 to 2010" by Ksakousti Skyllakou et al., Atmos. Chem. Phys. Discuss.,  
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The authors in this paper have studied the changes in PM<sub>2.5</sub> concentration and sources in USA over 2 decades (1990-2010). I have some suggestions which if included will further improve the manuscript.

- What do authors mean by exposure and how is it estimated differently when compared to concentration? Is the exposure estimated considering the variable populations in 1990, 2001 and 2010 or was the population kept fixed?
- The authors represent 2 decades 1990-2010 with 3 representative years: 1990,2001,2010. Are 3 individual years enough to give a complete picture of the effect of change in emissions on concentrations? This question becomes even more important when authors estimate the exposure and hence authors should also include observed vs predicted exposure in grids where observations are available in Table 3.
- The SOA exposure is in single digits in Table 3 which is much smaller when compared to concentrations. What is the reason behind the same?
- Population plays an important role when estimating exposure; viz: higher population will result in greater no people being exposed to the same concentration when compared to smaller population. Since population increased during 1990-2010 in USA, reduction in pollutant emissions should be high enough so as to negate the factor of increased population in order to indicate an overall reduction in emission of a pollutant. Is it the same case here?