

The paper titled "*Understanding the Long-term Trend of Organic Aerosol and the Influences from Anthropogenic Emission and Regional Climate Change in China*" uses the CAM6-Chem model to analyze trends in organic aerosol (OA) in China from 1990 to 2019, identifying the roles of anthropogenic emissions and climate factors. The findings highlight a modest OA increase due to a rise in secondary organic aerosols (SOA) and a decrease in primary organic aerosols (POA), influenced by emission changes and warming. This work enhances our understanding of how emission controls and climate change have shaped OA dynamics over the past three decades. Generally, the paper is well-organized and demonstrates significant effort. However, the following questions need to be addressed prior to publication:

1. As the paper spans 30 years, significant changes in land use (due to deforestation, increased green space in urban areas, etc.) could have occurred. Does the work consider the effect of land use change? If not, it would be helpful to add a few lines discussing the impact of land use on biogenic emissions and resulting SOA concentrations.
2. The paper shows the trend of VOC and S/IVOC emissions. However, these organic compounds have substantially different SOA formation potentials. As a result, it is unclear which of these compounds dominate the trend of ASOA abundance. A sensitivity analysis showing the contributions of these precursors to SOA would be helpful.
3. Figure 8b shows that O₃ in China did not increase significantly, which seems contrary to my understanding. Is this due to the nation-wide average vs. urban areas, where monitoring sites are located? The O₃ concentrations in Fig. S20 appear unreasonably high—please verify the results. Additionally, Fig. 9b shows that SOA contributions from different oxidants do not change with the oxidant. For instance, all oxidants decrease in the 0.5NO_x case, while SOA_{MT_O3} and SOA_{MT_NO3} increase, and SOA_{MT_OH} decreases. Could you clarify this?