Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC2
https://doi.org/10.5194/acp-2021-839-RC2, 2021

Comment on acp-2021-839

Anonymous Referee #3

Referee comment on "Nine-year trends of PM_{10} sources and oxidative potential in a rural background site in France" by Lucille Joanna Borlaza et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-839-RC2, 2021

The manuscript attempts to study nine-year interannual variations in components of PM_{10} and related oxidative potential at a rural site in France in terms of their trends in concentration, and their source apportionment, relationship with mitigation measures implemented. They found that organics dominantly contributed to PM_{10} mass concentrations, followed by nitrate and others, in annual scale. Their PMF analysis results showed that secondary aerosols (associated with long-range transport) acted as the dominant source. However, traffic, mineral dust, and biomass burning factors likely overwhelmed the contribution to oxidative potential. However, the large drop in traffic emissions during the period nationally didn't cause the response on oxidative potential. The study is important and worthy of publishing in ACP. This reviewer has only a few minor comments for the authors considering.

1) The samples were collected in a 6-day sampling interval, but not weekly samples covering each year. The weakness should be discussed if any real-time measurements of PM_{10} are available

2) Meteorological conditions would affect the long-term trends, and the issue should be quantified. This is particularly critical for semi-volatile species such as ammonium nitrate and organics when their interannual variations were analyzed.

3) Considering agriculture and natural emissions of ammonia, secondary aerosols could be formed before and during the long-range transport as well as formed locally. This may should be clarified.

4) Nacl could be derived from road salts or sea salts considering an inland site used in this study, please clarify.

5) Lines 276-277, "The NH_4^+/NO_3^- mass ratio in this factor is 0.22, close to the mass ratio (0.29) indicating the formation of NO_3NH_4 in the particulate phase." The statement does not sound scientific considering PM_{10} to be studies; the same comment is applied to lines 281-282" The NH_4^+ to SO_4^{2-} molar ratio of 0.4 suggests that sulphates are mostly present as $(NH_4)HSO_4$ and only a small fraction as $(NH_4)_2SO_4$. "