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Comment on acp-2022-100

Anonymous Referee #2

Referee comment on "Measurement report: The 10-year trend of $PM_{2.5}$ major components and source tracers from 2008 to 2017 in an urban site of Hong Kong, China" by Wing Sze Chow et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-100-RC2, 2022

The manuscript presents a ten-year data set of $PM_{2.5}$ major components and source-specific tracers at an urban site in Hong Kong, South China. The authors investigate the trends of these compounds and evaluate the influence of emission control on their variations. They also discuss the impact of ENSO events on the abnormal change in $PM_{2.5}$ components, especially in 2011. Overall, I think the research is äººé□´å°□quite interesting and valuable to the community. I recommend the manuscript to be published in the journal after considering the following specifics:

Major concerns:

- There should be emission inventory data in Hong Kong and the PRD. If so, the authors are suggested to compare the long-term trends of PM_5 species (tracers) with the variations of local and regional emission inventories. For example, when the authors discuss the long-term variations of SO_2 and EC, they list the major emission control measures implemented in Hong Kong (Figure 7 and 8, respectively). Are the changes in these species consistent with the variations in emission inventories in Hong Kong?
- Recent studies have demonstrated that organic compounds, such as levoglucosan and hopanes, are not stable in the atmosphere as previously thought. As Table 2 shows, the levels of ozone continue to increase at the site. This implies that the atmospheric oxidation capacity is increasing. The authors should add some discussion about the influence of the increase in oxidation capacity on the decrease of organic species.
- In section "3. 4 Secondary inorganic aerosol components", the authors discuss the uneven reduction of SO_2-sulfate and NOx-nitrate. How about the temporal trends of sulfur oxidation rate (SOR) and nitrogen oxidation rate (NOR)? The changes in SOR and NOR might provide additional information about the formation chemistry of sulfate and nitrate.

Minor comments

Page 8 line 233-234. The authors state that the decrease in EC is due to local control of vehicular emissions. However, in addition to vehicular emissions, EC could be emitted from biomass burning and shipping exhaust. In fact, the tracers of the latter two sources (e.g., K^+ and Ni) also continued to decrease (Table 2). The "%Relative change" of EC is close to that of K^+.

Page 12 Figure 5. SO_2 had a local source in 2008 but a regional source in 2017. What is the explanation?

Page 19 Table 4. The coefficients in WINTER are not listed in Table 4.