

Review of Ding et al. “Ozone and fine particle in the western Yangtze River Delta: an overview of 1-yr data at the SORPES station”

General comments

This manuscript demonstrates a newly set-up regional background site (SORPES) in the western Yangtze River Delta by analyzing 1-yr measurements of O₃, PM_{2.5}, and related parameters. Such a station is critical for filling the knowledge gap in regional air pollution and inherent chemical and dynamic causes in the western YRD where investigations were relatively scarce. The measurements are of good quality, and the data interpretation is also fine. The results including the roles of super-/sub-regional transport and synoptic weather conditions in O₃ and PM pollution are attractive. The paper is generally very well written. In view of the above, I suggest publication at ACP after the following minor revisions made.

Specific comments

1. Section 2.1: since this is the first report of the measurements at the SORPES station, it would be better to give a more detailed description of the measurements, including QA/QC procedures, uncertainty estimation, etc., maybe in the supplementary material. For example, how often were the multi-point calibrations performed? Was the internal zero automatically done for the CO analyzer? How to calibrate the NO_y converter and what's the conversion efficiency during the measurements? What's the performance of the PM_{2.5} monitor under conditions of high RH (e.g. fogs)? Was there any available inter-comparison among different techniques, such as online and filter-based PM_{2.5} measurements? What are the accuracy, precision, and uncertainty of all the measurements?
2. Section 2.2: indicate the source of the meteorological data. Were they recorded at the SORPES site?
3. P2841, L17-18, “The residence time of particles at 100 m level was used to identify footprint...”: I wonder if it is “at 100 m” or “within the 100 m level”.
4. P2843, the last paragraph: I think the variation of the boundary layer height should be another factor shaping the seasonal cycle of PM_{2.5}”.
5. P2845, L2-3: indicate the SO₂/NO_y ratios obtained from the presents study and at Lin'an ten years ago.
6. P2850, L16: change to “wheat and rice production alternating in cold and warm seasons”.
7. P2852, Section 3.4, title: change to “...implications for air pollution control measures”.
8. Table 2: I think the units for O₃ concentrations should be μg m⁻³, other than mg m⁻³.
9. Table 3: re-format the heading row of the table.
10. Figure 4: what do the dotted lines in Fig. 4b and 4c mean? Indicate the equation and coefficient of the polynomial fitting in Fig. 4d.
11. In the manuscript there are both some “mid-YRD” and many “middle-YRD”. Please make consistent.

Technical corrections

1. P2836, L8: delete “also indicates”.
2. P2837, L6: change “favor” to “favors”.
3. P2837, L7: delete “all”.
4. P2838, L14: define “GAW”.
5. P2838, L17: change “in urban sites” to “in urban areas”.
6. P2839, L26: change “the SORPES sites” to “the SPRPES site”.
7. P2840, L17: delete “of trace gases and aerosol concentrations”.
8. P2840, L27: change “measurement” to “measurements”.
9. P2841, L20: change “if” to “for”.
10. P2842, L5-6 and 8: change “were generally originating from” to “generally originated from”.
11. P2843, L3: change “in November” to “in winter (November)”.
12. P2843, L14: change “cause for” to “cause of”.
13. P2845, L2: change “previous” to “previously”.
14. P2847, L3: change “upwind from Nanjing” to “upwind of Nanjing”.
15. P2852, L10: “in this region”.
16. P2852, L16: change “combustions” to “combustion”.
17. P2853, L17: change “but nevertheless” to “nevertheless”.
18. P2853, L20: change “for” to “from”.
19. P2853, L25: change “they” to “there”.
20. P2854, L5: a typo, “Summary”.
21. P2854, L11: change “can be” to “are”.
22. Fig. 5a. Legend: change “episodes” to “O₃ episode”.