

Interactive comment on “Regional severe particle pollution and its association with synoptic weather patterns in the Yangtze River Delta region, China” by Lei Shu et al.

Anonymous Referee #2

Received and published: 1 July 2017

In this manuscript, the regional characteristic of aerosol and its relation with synoptic weather patterns were discussed over the Yangtze River Delta region China. There are a lot of previous studies about PM₁₀ and PM_{2.5} pollution in China. However, only a few of them have focused on the potential impacts of weather patterns on this kind of pollution. The results of this manuscript may be of great interests to the ACP audiences. Also, the study may be able to provide some useful views for the government on the air pollution control. Several comments and suggestions should be addressed before the publication of this paper. (1) Section 3.1.1 and 3.1.3. Apart from the in-situ monitoring particle concentration records, the aerosol optical depth data (monitored records, satellite observation, etc.) can be analyzed to deep the discussion on the

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particle pollution in YRD. (2) Section 3.2.2, the author only mentioned and analyzed the geopotential height fields and wind fields at 850 hPa on the key date. The results may be quite different when it comes to the averaged condition of all days corresponding to each weather pattern. It's suggested to add the averaged geopotential height fields and revise the discussion. (3) Section 3.3.1, the occurrence frequencies of five weather patterns during the regional particle pollution episodes are not yet enough to conclude the relationship between them. It's suggested to add more detailed analysis for the monitoring data of particles (PM_{2.5} and PM₁₀) and their precursors (such as SO₂, NO₂, etc.) at surface corresponding to each weather pattern. (4) Section 3.3.2, the wind speed and wind direction at surface are closely related to the transport processes. It's suggested to add the analysis of meteorological parameters from observational records corresponding to each weather pattern instead of NCEP reanalysis data. (5) The English should be polished. Some grammatical errors in this paper are listed as follows, Line 75, "Eastern Asian monsoon circulation" should be "East Asia monsoon circulation", "increasing aerosol loading" should be "increased aerosol loading". Line 110, "focuses the pollution" should be "focuses on the pollution". Line 271-272, "the most importance source" should be "the most important source". Line 577, "it also confirmed" should be "it was also confirmed". It is suggested to correct the errors with the aid of a professional language correcting company.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-473>, 2017.

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