

Interactive comment on “Inter-annual variation of aerosol pollution in East Asia and its relation with strong/weak East Asian winter monsoon” by Min Xie et al.

Anonymous Referee #2

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The deterioration of air quality (caused by aerosols) and the change in monsoon climate are two environmental threats to the people living in East Asian monsoon region. This paper presents an interesting and important study on the inter-annual variation of EAWN and its impact on the aerosol pollution in East Asian combining observation and numerical simulation. The outcome could lead to a better understanding of the interaction between aerosol and monsoon in particular East Asia. The manuscript fits the aim and the scope of ACP. Before being published, it still needs revision. The comments are listed as below.

Introduction -Very good review on the impact of EWAM on aerosol transport and fog

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formation based on both long-term observation and air pollution episode, but lacks a critical discussion of the mechanism how EWAM will affect aerosol pollution and Vice Versa. -The language needs some editing from a native speaker.

Methodology -The data used for EAWMI calculation and meteorological analysis are from 1979 to 2014, but the used AOD data are from 2000 to 2013. The time length is not the same. Why? -Could you explain in more detail how the two-way coupling is achieved? A model validation should also be presented to demonstrate the robustness of the simulation.

Results and discussion -Line282- please clarify why the anomalous monsoon circulation may play a role in the inter-annual AOD? -Figure 3b- what do you mean the change of AOD over 2000-2013? could you show BTH, SCB,YRD and PRD in the figure 3? -Figure 4- as the AOD is only collected between 2000-2013, could you compare AOD and EAWMI within this time scale? Same results could be obtained? -I have some concerns on directly linking AOD with EAWMI as there are many influential factors determining AOD especially emissions. Key question is how to eliminate the influence of other factors to derive a more conclusive conclusion.

Language The English should be polished. There are many grammar errors. Some are listed as follows.

Line 23, "the inter-annual variations of EAWM" is better to be "the inter-annual variation of EAWM". Line 32-33, "resulting in higher (lower) AOD in the north and lower (higher) AOD in the south" is better to be changed as "resulting in higher (lower) value of AOD in the north and lower (higher) in the south". Line 58, "changes of" is better to be "changes in". Line 60 "the air quality", "the" is better to be deleted. Line 109, "periods" is better to be "period". Line 146, please keep "distribution" and delete "and transport". Line 175, "NECP" should be "NCEP". Line 342, "above 1" is better to be revised as "over 1". Line 381, "a dry cold climate" is better to be revised as "a dry and cold climate". Line 406, "obtained" should be deleted. Line 459, the first from should be deleted. Line

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499, “the NCEP reanalysis data is adopted to” should be “the NCEP reanalysis data are adopted to”.

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