

# ***Interactive comment on “Dominant synoptic patterns associated with the decay process of PM<sub>2.5</sub> pollution episodes around Beijing” by Xiaoyan Wang et al.***

## **Anonymous Referee #1**

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1. The introduction lacks of progresses about research issues.
2. The colors in Figure 3 make the readers confused, need to be modified.
3. Line 149, “which is known as a sawtooth cycle”, the adjustment interval of synoptic circulations is related to the period of Rossby waves, which is about 1 week.
4. Line 175, why not to choose other weather typing approaches, such as Lamb-Jenkinson method. It's have no associations with sample data.
5. Line 270, strong vertical shear? The top of PBL was located between positive and negative wind shear in most cases where the shear is about zero. Have you compared

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with pollution situations? This may be caused by the air with different properties within or above the PBL.

6. Line 412, horizontal wind shear, do you mean vertical shear of horizontal winds?

7. About the primary conclusions in paper, we have already known that meteorological conditions, such as strong winds and low relative humidity, are favorable for removing pollutants. However, in CT1, pollutants within PBL diffused upward, while flows presented to be sinking motion in CT2 and CT3 in contrast. What is the leading mechanism for removing pollutants in different patterns?

8. How much is the contribution of horizontal advection and vertical diffusion respectively for removing pollution in different types and seasons? And mainly through which layer do pollutants diffuse downstream?

9. The whole paper needs to be more standard and concise. Some conclusions are moved to the discussion section. The removing mechanisms in different synoptic patterns need to be more clarified.

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