

## ***Interactive comment on “Intermittent turbulence contributes to vertical diffusion of PM<sub>2.5</sub> in the North China Plain” by Wei Wei et al.***

**Anonymous Referee #2**

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This manuscript investigates the role of intermittent turbulence in alleviating heavy pollution episodes that frequently occur in China. The paper includes a theoretical background and analysis of measurement data related to 2 pollution episodes. While the vast majority of the prior research on air pollution episodes in China has concentrated on the factors favoring the accumulation of pollutants, this paper investigates a phenomenon that helps to get rid of high pollution levels. As such, I think that this paper is original enough to warrant publication in ACP. I have a few issues that should, however, be addressed before the publication.

The authors introduce an Intermittent Factor (IF) which they use for explaining the effects of intermittent turbulence on the observations. I have a few comments on this. First, it seems that  $q$  is the key variable when determining IF. Therefore, the authors

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should explain more explicitly what is the exact meaning of  $q$ , not just to mention that it is the power exponent of the instantaneous amplitude of something. Second, IF is defined such that it is zero for fully developed turbulence and negative if not. However, the exact value of IF does not tell anything for the reader. Would it be possible to provide some idea how to interpret the value of IF. How small (or large in absolute sense) should IF be for the intermittent turbulence to be important etc?

The discussion of Figure 5 in the beginning of page 11 is a bit confusing. The authors state that the difference for CSs is much more obvious. I do not understand this statement. By looking at the figure, the different curves for TS show more spread than the curves for CS. So what are the authors referring to when discussing about differences? Also, figures 5a-d have the straight line for fully developed turbulence (faint solid black lines). This line should show up more clearly in the figure and it should be said that it is a solid line.

Please check out that all the used mathematical symbols are explained in the text.

A few grammatical issues:

Page 1, line 25 should read "particulate matter" Page 14, line 7: ...we summarize...

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