Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Effects of turbulence structure and urbanization on the heavy haze pollution process" by Yan Ren et al.

Anonymous Referee #1

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General comments: This manuscript analyzed the turbulence data observed from several severe haze pollution episodes in Beijing and its nearby suburbs by using the developed automated algorithm of identifying the spectral gap to separate pure turbulence and submesoscale motions from a 30-min signal based on the arbitrary-order Hilbert spectral method. Although I agree that the motivation of this study is good and its results are interesting, the presented study still needs some minor revision including the improvement in English before consideration for publication.

Specific comments: 1.In the abstract, "Urbanization seems to help reduce the consequences of pollution" may be somewhat misleading. 2.Line 16 in Page 3, "turbulence data observed from several severe haze pollution episodes", "from" should be changed to "in" or "during". 3.The data source of PM2.5 mass concentration, horizontal wind

speed, virtual temperature and water vapor mixing ratio need be described. The details of all the data used in this study should be included in the Section. 4.It may be better to modify the title of Section 3 as "Methodology" or "Methodology of reconstructing signals". Section 2.2 may be merged into "Methodology". In a word, Section 2 and Section 3 should be rearranged. 5.In Figure4, the comparison is made between the new half-hour results with those from the old results. Which is the reference? Is the overestimation of the variations in the variables calculated by the traditional EC method for 30 min referenced to the results using the new method? Then, what is the reference to assess the new method? Here, the description is confused. 6.What's the difference of PM2.5 in Fig.6-8 and Fig.2? How about the difference of data source? More details need be described. 7.In Fig. 9-11, the description of lines is wrong.