

***Interactive comment on “How to improve the air quality over mega-cities in China? – Pollution characterization and source analysis in Shanghai before, during, and after the 2010 World Expo” by K. Huang et al.***

**Anonymous Referee #2**

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This manuscript addressed a very important issue. The 2010 World Expo held in Shanghai provided a unique opportunity to analyze the effectiveness of human-perturbed emission reduction on air quality. The conclusions of this manuscript have important implications for the future improvement of the air quality in Shanghai and other mega-cities around the world. The manuscript was well organized and presented. Therefore, the manuscript is suggested to be accepted by ACP with minor revisions documented below: 1. I gave a comment that the author did not provide enough proves for the probable formation mechanism of some pollution episodes when reviewing the

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1st version of the manuscript. I am afraid the author did not address it adequately in the discussion paper. For example, the author attributed the sharp increase of SIA concentrations during Oct 31 - Nov 1 to the rebound of air pollutant emissions as soon as the World Expo was announced closed, especially the sharp increase of vehicle emissions. The author tried to preclude the possibility of this heavy pollution controlled by unfavorable meteorological conditions by saying that the major meteorological parameters fluctuated little during the period from Oct 26 to Nov 1 (Page 3393, Line 6-16). However, we noticed that Shanghai experienced strong northerly wind during Oct 23 – Oct 29. In contrast, stagnant meteorological conditions dominated during Oct 30 - Nov 1, favoring the accumulation of air pollutants. I am not arguing that the sharp increase of PM is only attributed to the unfavorable meteorological conditions, but I think both the emissions and the meteorological conditions might contribute to the sharp increase. If you exclude the impact of meteorology, how do you explain the sharp decline of PM concentrations on Nov 2? It would be more convincing if the author could clarify the relative importance of emission increase and weather conditions.

2. The organization of this manuscript is a little in disorder. The analysis of typical pollution episodes, the comparison between pre-Expo, Expo, and post-Expo, and the comparison between 2009 and 2010 are twisted together. In section 3.4, the author conducted a “comprehensive comparison” between 2009 and 2010, and some of the content in this section overlaps with the previous sections. I suggest the author re-organize some of the text. For example, the author might focus on the analysis of typical pollution episodes, and the comparison between pre-Expo, Expo, and post-Expo in section 3.1-3.3, and compare 2009 with 2010 in section 3.4. It is the best if the abstract and conclusion parts are re-organized accordingly.

3. In the abstract, key findings should be summarized in a manner which gives clearer conclusion on the effectiveness of the stringent temporary control measures during the World Expo, and derives significant policy implications.

4. Page 3382, Line 19, and Page 3405, Line 13-15, “Huang et al., 2012” should be

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“Huang et al., 2012c”?

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 3379, 2013.