

## Response to Reviewer's Comments from Referee, D. Leung

The paper described the result of an air quality measurement during a major traditional festival in a major city in China i.e. Shanghai. The study period involved massive pollution related activities before and after the festival. The observed trends of various pollutants were correlated with activities of local anthropogenic emission sources and most of the explanations were reasonable. There are not too many studies on the impact of emission variations on air quality in mega cities of similar nature. As a whole, the information in this study provides a useful reference for the authority to control the emission from anthropogenic emission sources and for future air quality study in China. One specific comment is as follows: The study concluded the importance of controlling vehicle numbers and emissions in mega-cities of China. Some recommendation of how this can be achieved in a fast grown mega-cities such as Shanghai, should be provided.

We thank for the reviewer's comment and suggestion. We have made some recommendations of controlling vehicle emission as follows:

Although the individual vehicle emission has been greatly reduced by using advanced technology, the dramatic increase of vehicles numbers and driving miles has offset much of the emission control progress. Controlling the vehicle numbers is at least as important as controlling vehicle emissions. As the numbers of private cars goes up very quickly in the mega-cities in China, restriction of private cars should be an efficient measure that may take into effects in a short-term. It has been well demonstrated that notable air quality improvement was achieved during the Beijing Olympic Games period when the odd-even car license ban policy and some other traffic restriction measures were taken (Huang et al., 2010; Shen et al., 2011; Wang et al., 2009).

The traffic congestion is getting worse in recent years attributed to the dramatic increasing vehicle numbers, which grew much faster than the road infrastructure (Lin, 2003). On the one hand, the measures to solve the traffic congestion should not only include revising traffic-management schemes, such as building and improving public transport, promoting bike use and walking, but also more efficient land-use patterns,

which aim to achieve a minimum of the need to drive from home for work, education or shopping. On the other hand, the social inequities derived from automobile usage should be taken into consideration to restrict the increasing private-ownership cars. The externality costs of car using, including air pollutants emission, health issues and public infrastructure and so on, which are now imposed on the whole society, should be assumed by the car user individually.

#### References:

Huang, X. F., He, L. Y., Hu, M., Canagaratna, M. R., Sun, Y., Zhang, Q., Zhu, T., Xue, L., Zeng, L. W., Liu, X. G., Zhang, Y. H., Jayne, J. T., Ng, N. L., and Worsnop, D. R.: Highly time-resolved chemical characterization of atmospheric submicron particles during 2008 Beijing Olympic Games using an Aerodyne High-Resolution Aerosol Mass Spectrometer, *Atmos. Chem. Phys.*, 10, 18, 8933-8945, 2010.

Lin, G.: Globalization of the automobile industry in China: dynamics and barriers in greening of the road transportation, *Energy Policy*, 31, 6, 537-551, 2003.

Shen, J., Tang, A., Liu, X., Kopsch, J., Fangmeier, A., Goulding, K., and Zhang, F.: Impacts of Pollution Controls on Air Quality in Beijing during the 2008 Olympic Games, *J. Environ. Qual.*, 40, 1, 37-45, 2011.

Wang, X., Westerdahl, D., Chen, L. C., Wu, Y., Hao, J., Pan, X., Guo, X., and Zhang, K. M.: Evaluating the air quality impacts of the 2008 Beijing Olympic Games: On-road emission factors and black carbon profiles, *Atmospheric Environment*, 43, 30, 4535-4543, 2009.