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Title: Impact of Siberia forest fires on the atmospheric environment over the Korean Peninsula during summer 2014

Authors: Jinsang Jung et al.

Responses to the reviewer's specific comments and questions;

Reviewer #2 (Comments):

General Comments:

Dear Authors, Thank you for this manuscript. It describes an interesting case study of long-range transport of Siberian smoke to Korea. I think this paper will produce an interesting contribution to ACP.

My main question regarding your analysis is that you do not discuss the potential contribution of biofuel to the southern China haze event. Many literature sources indicate that biofuel is a significant contributor to the energy mix and to the air pollution in rural Chinese areas. I think your analysis would be strengthened if you examined the chemical composition of the southern Chinese haze in the context of literature estimates of biofuel consumption in the southern Chinese region. The recent paper by Rongrong Wu et al. (doi:10.1016/j.atmosenv.2015.12.015) would be a good place to start.

Response: Thank you for the comment. Following paragraph has been added in lines 298-314 in the revised MS.

"It has been reported that biomass burning (including biofuel) contributed 14.1% of the total VOC emissions in China during 2012, whereas in Anhui province the contribution of biomass combustion to VOC emissions was 28.7% (Wu et al., 2016). Li et al. (2015) reported that biomass burning contributed 58% of OC in Nanjing, China during summer 2012, suggesting that biomass burning is the dominant source of OC in this region. Du et al. (2011) classified the haze events in Shanghai, China during summer 2009 into three categories: biomass-burning induced (high K^+, low SO_4^{2-} and NO_3^-), complicated (high SO_4^{2-} and NO_3^-, good correlation between K^+ and SO_4^{2-} and NO_3^-), and secondary (high SO_4^{2-} and NO_3^-, low K^+) pollution. Because Anhui, Nanjing, and Shanghai are located near the source of the long-range transported

Chinese haze (Fig. 8), the chemical composition of pollution in those areas can be used to understand the Chinese haze episode observed in this study. Temporal patterns in K^+ concentration are similar to those of SO_4^{2-}, and a sharp increase in SO_4^{2-} concentration was observed during the Chinese haze episode (Fig. 9). This type of pollution episode is similar to the 'complicated' pollution described by Du et al. (2011), and suggests that the Chinese haze episode was caused mainly by secondary aerosol such as SO_4^{2-} and NH_4^+, rather than by biomass burning emissions."

Three references were added in the reference section.

Du, H., Kong, L, Cheng, T., Chen, J., Du, J., Li, L., Xia, X., Leng, C., and Huang, G.: Insights into summertime haze pollution events over Shanghai based on online water-soluble ionic composition of aerosols, Atmos. Environ., 45, 5131–5137, 2011.

Li, B., Zhang, J., Zhao, Y., Yuan, S., Zhao, Q., Shen, G., and Wu, H.: Seasonal variation of urban carbonaceous aerosols in a typical city Nanjing in Yangtze River Delta, China, Atmos. Environ., 106, 223–231, 2015.

Wu, R., Bo, Y., Li, J., Li, L., Li, Y., and Xie, S.: Method to establish the emission inventory of anthropogenic volatile organic compounds in China and its application in the period 2008-2012, Atmos. Environ., 127, 244–254, 2016.

Apart from that, this paper is scientifically sound and the conclusions are reasonable. I believe this paper would benefit from a thorough editing to improve grammar and remove typographical errors. Best of luck with your revisions, and thank you again.

Response: Thank you for the comment. The revised MS has been proofread by a English native speaker.