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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ozone weekend effects in the Beijing–Tianjin–Hebei metropolitan area, China" *by* Y. H. Wang et al.

Y. H. Wang et al.

wangyonghong@dq.cern.ac.cn

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Response to reviewer 3#: We are very grateful to the reviewer for the constructive suggestions and for the proposed corrections to improve our paper. Here, all the issues raised had been addressed. Accordingly, the manuscript had been modified. Detailed comments Line 159-165, the author give such results of TG site has a significant weekend effect and the inner land sites have a moderate weekend effect. According table2 it is difficult to get those results. Please give more convictive evidence to prove it. Response: Thanks very much for your suggestion. In our unrevised manuscript, we used 24-hour averaged surface ozone concentration to calculate OWE in these sites. According to table 2 TG site have a OWE of 11% (defined as (weekend ozone

–weekday ozone)/weekday), which is the most in these sites. Combined with the difference of NOx and NO, we affirm that TG site has a significant weekend effect. However, inland sites, such as LF, LTH, YF, BD, SQL and BJT, are always subject to large amount of ozone precursor emissions from their daily life, such as vehicle emissions and cooking emissions, which may not vary as significantly as factory emissions on every day of week. Consequently, these sites have a moderate weekend effect compared with TG. In our revised manuscript, we recalculated OWE using daytime (08:00-18:00, Beijing time) data according to other two reviewers' suggestions. The results showed that there is still a significant OWE at TG site as showed in table below (supplement information). Line 191, (at YJ, on Sunday) maybe is (at QA, on Sunday). Response: Thanks very much for your comments. We corrected the site name. From Fig.9, the Sunday concentration is not the lowest; it is much higher than other days at TG,SQL,BJT,TJT and QA site. It is contradictory to the conclusion of decrease in emission from vehicles and factories. Response: Thanks very much for your comments. In this study, we focus on variations of surface ozone and other pollutants on weekend and weekday, not just on a specific day. The weekend was defined as Saturday, Sunday and Monday. The weekday was Thursday, Wednesday and Friday. Aerosol concentrations are not the lowest on Sunday, but Monday .This is mainly due to decrease in emission on Sunday night and early Monday morning. From Fig.9(g,g'), we know the aerosol concentration is the lowest in Monday, but from fig.10 the UV radiation of Monday is not the largest(third). The weekly variation in UV radiation is not affected by aerosol's variation, it maybe impacted by cloud Response: Thanks very much for your suggestion. In our study, we used 24-hour averaged aerosol concentration to calculate the weekly variations. Therefore, the lowest aerosol concentration value occurred in Monday is mainly from reduction emission on Sunday night and early Monday morning, as we analyzed in the paper. However, the weekly variation in UV radiation is calculated using only daytime and valid data, which makes Sunday have the most UV radiation value. As Tang et al. (2009) reported OWE in Shanghai using MICAPS data, the weekly variation of cloud cover is a proof that OWE

is from Photochemistry. We think both weekly variation of cloud fraction and aerosol concentration impact UV radiation, but the weekly variation of cloud fraction over BTH area was not investigated before. We also think this is a meaningful work to study weekly variations of cloud fractions over one of the most polluted areas over China later. Reference Tang, W. Y., Zhao, C. S., Geng, F. H., Peng, L., Zhou, G. Q., Xu, J. M., and Tie, X. X.: Study of ozone "weekend effect" in Shanghai, Science in China Series D: Earth Sciences, 51, 1354-1360, 2008.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/13/C6928/2013/acpd-13-C6928-2013-supplement.zip

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 13045, 2013.