

## Accepted Manuscript

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PII: S0169-8095(17)30425-8  
DOI: doi: [10.1016/j.atmosres.2017.07.003](https://doi.org/10.1016/j.atmosres.2017.07.003)  
Reference: ATMOS 3997  
To appear in: *Atmospheric Research*  
Received date: 13 April 2017  
Revised date: 3 July 2017  
Accepted date: 6 July 2017

Please cite this article as: Yu Zheng, Huizheng Che, Tianliang Zhao, Hujia Zhao, Ke Gui, Tianze Sun, Linchang An, Jie Yu, Chong Liu, Yongcheng Jiang, Lei Zhang, Hong Wang, Yaqiang Wang, Xiaoye Zhang , Aerosol optical properties observation and its relationship to meteorological conditions and emission during the Chinese National Day and Spring Festival holiday in Beijing, *Atmospheric Research* (2017), doi: [10.1016/j.atmosres.2017.07.003](https://doi.org/10.1016/j.atmosres.2017.07.003)

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# Aerosol optical properties observation and its relationship to meteorological conditions and emission during the Chinese National Day and Spring Festival holiday in Beijing

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**Abstract:** The reduction of traffic flow in downtown areas during the Chinese National Day holiday and the fireworks during the Spring Festival provide a unique opportunity for investigating the impact of urban anthropogenic activities on aerosol optical properties during these important Chinese festivals in Beijing. The National Day in 2014 and 2015 and Spring Festival in 2015 and 2016 were selected as study periods. The aerosol optical depth (AOD) at 440 nm increased over the all holiday periods and the average AODs during the 2015 National Day, 2015 Spring Festival and 2016 Spring Festival were about 81%, 21% and 36% higher than the background levels, respectively. The average AOD in 2014 National Day holiday was lower than background level partly influenced by precipitation event. The absorption AOD (AAOD) at 440 nm showed consistent variations with the AOD and the average AAODs during the 2015 National Day, 2015 Spring Festival and 2016 Spring Festival holidays were

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