

Variation of temporal and spatial patterns of NO₂ in Beijing using mobile DOAS during the APEC in 2014 and the Victory Day Parade in 2015

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Recently Chinese cities have suffered severe haze events, especially in North China Plain (NCP). It has the characteristics of regional scale and complex components with high concentration level. In order to learn the haze formation, it is necessary to investigate temporal and spatial distribution of pollutants, emissions and pollution transport for better understanding of the impact of various sources on air quality. Control policies such as “odd-and-even license plate rule” were implemented by the Chinese government to restrict traffic and suspend factory production in Beijing and neighboring cities during the Asia-Pacific Economic Cooperation summit (APEC) in 2014 and Victory Parade in 2015. We use mobile differential optical absorption spectroscopy (DOAS) and multi-axis differential optical absorption spectroscopy (MAX-DOAS) to measure the variation of the spatial and temporal patterns of NO₂ column densities from October 24, 2014 to December 31, 2014 and from August 25, 2015 to September 7, 2015. It is found that the NO₂ column densities during the episode of control policies are significantly lower than those during other periods, and the emission flux of NO₂ calculated by mobile DOAS is also lower than the results from other periods. There was a further 45.5% decline of the emission flux of NO₂ in Beijing fifth ring road during the Victory Day Parade in 2015 than during APEC period. The low NO₂ column densities that occur during the episode of control policies are affected by the control policies as well as meteorological conditions.