



Seasonal variation of trace gas compounds and PM_{2.5} observed at an urban supersite in Beijing

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The air pollution in Beijing has been a growing concern in the last ten years. We have performed measurements on trace gas compounds (CO, NO_x, NO_y, O₃, SO₂), PM_{2.5}, and meteorological parameters at Beijing urban Atmospheric Environmental Observation Station in the campus of Peking University for more than ten years. The measurement results provide us an opportunity to track the air quality change in downtown Beijing. Here, we present observations during year between 2011 and 2015. The annual averaged concentration of CO, NO_x, NO_y, O₃, SO₂, and PM_{2.5} is 1.2 ± 0.1 ppm, 49.9 ± 5.9 ppb, 54.6 ± 4.7 ppb, 26.1 ± 3.8 ppb, 10.6 ± 2.9 ppb, and $53.4 \pm 9.8 \mu\text{g} \cdot \text{m}^{-3}$, respectively. A clear seasonal variation is identified for all the measured trace gas compounds and PM_{2.5}. CO, NO_x, NO_y, SO₂, and PM_{2.5} show their maximum in winter and minimum in summer. Whilst O₃ shows an inverse pattern. This result indicates that the air pollution in Beijing is characterized by haze in winter but by photochemical smog in summer. The effects of meteorological conditions and emissions on the occurrence of pollution episode are discussed in details based on the long-term observation data set.