



Observation of a "holiday effect": a case of Chinese New Year in Taipei

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Our study was an attempt to conduct a comprehensive and systematical examination of the holiday effect, defined as the difference in air pollutant concentrations between holiday and non-holiday periods. This holiday effect can be applied to other countries with similar national or cultural holidays. Hourly and daily surface measurements of six major air pollutants from thirteen air quality monitoring stations of the Taiwan Environmental Protection Administration during the Chinese New Year (CNY) and non-Chinese New Year (NCNY) periods were used. We documented evidence of a "holiday effect", where air pollutant concentrations were significantly different between holidays (CNY) and non-holidays (NCNY), in the Taipei metropolitan area over the past thirteen years (1994-2006).

The concentrations of NOx, CO, NMHC, SO2 and PM10 were lower in the CNY than in the NCNY period, while the variation of O3 was reversed, which was mainly due to the NO titration effect. Similar differences in these six air pollutants between the CNY and NCNY periods were also found in the diurnal cycle and in the interannual variation. For the diurnal cycle, a common traffic-related double-peak variation was observed in the NCNY period, but not in the CNY period. Impacts of dust storms were also observed, especially on SO2 and PM10 in the CNY period. In the 13-year period of 1994-2006, decreasing trends of NOx and CO in the NCNY period implied a possible reduction of local emissions. Increasing trends of SO2 and PM10 in the CNY period, on the other hand, indicated a possible enhancement of long-range transport. These two mechanisms weakened the holiday effect.