PM levels in urban area of Bejaia

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Abstract

Air pollution is not routinely measured in Bejaia City, Algeria, an urban area of around 200,000 inhabitants. We present first time measurements of particulate matter (PM) mass concentrations for this city (PM10, PM7, PM4, PM2.5 and PM1) over the course of one week, from July 8 to July 14, 2015. This study covered eight urban sampling sites and 169 measurements were obtained to determine mass concentration levels. The average city-wide PM10 and PM2.5 concentrations measured during this sampling were $87.8 \pm 33.9$ and $28.7 \pm 10.6 \, \mu g/m^3$ respectively. These results show that particulate matter levels are high and exceed Algerian ambient air quality standards (maximum $80 \, \mu g/m^3$, without specifying the particle size). Further, PM10 and PM2.5 averages were well above the prescribed 24-hour average World Health Organization Air Quality Guidelines (WHO AQG) ($50 \, \mu g/m^3$ for PM10 and $25 \, \mu g/m^3$ for PM2.5). The PM1, PM2.5, PM4 and PM7 fractions accounted for 15%, 32%, 56% and 78% respectively of the PM10 measurements. Our analysis reveals that PM concentration variations in the study region were influenced primarily by traffic. In fact, lower PM10 concentrations ($21.7$ and $33.1 \, \mu g/m^3$) were recorded in residential sites while higher values ($53.1$, and $45.2 \, \mu g/m^3$) were registered in city centers.

Keywords: Particulate matter, Urban area, vehicle fleet, Bejaia.