

Comparison of particulate matter and black carbon variation in urban and suburban sites in Algiers, Algeria

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This work aims to compare the continuous variation of particulate matter (PM) and black carbon (BC) in urban and suburban sites in Algiers, Algeria from 13 April to 31 May 2017. For this purpose, an analyzer of PM was used for the first time in Algeria (FIDAS 200) together with an aethalometer AE33 for BC measurement. The levels of BC reached 8.500 $\mu\text{g}/\text{m}^3$ in the suburban site of Bouzareah (where is situated the CDER) and 49.000 $\mu\text{g}/\text{m}^3$ in the urban site (Algiers center) with respectively means of 0.945 and 3.789 $\mu\text{g}/\text{m}^3$. The average of PM₁, PM_{2.5}, PM₄, PM₁₀ and PM_{total} in the two sites were respectively (7.561 and 10.177 $\mu\text{g}/\text{m}^3$), (10.513 and 14.166 $\mu\text{g}/\text{m}^3$), (19.479 and 24.362 $\mu\text{g}/\text{m}^3$), (30.028 and 35.730 $\mu\text{g}/\text{m}^3$) and (43.614 and 50.465 $\mu\text{g}/\text{m}^3$). In the urban site, PM₁₀ averages are lesser than the Algerian and WHO standards, but higher than the European objectives of air quality. However, the PM_{2.5} means exceeded largely the annual WHO standards. The rates of BC in PM₁ are very high (12.49 and 37.23%) respectively, which is due to the car fleet especially in the urban site. The size distribution of atmospheric particles shows that the particles are mostly coarse with respectively 84% and 81%, which is explained by the sands coming from the Sahara. A meteorological study was carried out to understand the sources of pollution peaks, followed by a modelling maps obtained by EMEP and Modis Models for the PM and Hysplit Model for the back trajectories of winds.