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Black Carbon Instead of Particle Mass Concentration as an Indicator for the Traffic Related Particles in the Brussels Capital Region

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Author(s)

Peter Vanderstraeten, Michael Forton, Olivier Brasseur, Zvi Y. Offer

ABSTRACT

The Brussels Capital Region has difficulties in meeting the stringent EU daily limit value for PM10 in all its measuring sites. Postponing the attainment of the deadline was not granted by the EU Commission, mainly due to insufficient judged measures to reduce road traffic emissions. However, a thorough analysis of the data makes clear that neither the particle mass concentration (PM10 and PM2.5) nor the particle number concentration are specific metrics for evaluating the particle pollution originated by traffic. In fact, increased formation of secondary aerosol, together with adverse meteorological conditions and the (re) suspension of the coarser fraction are by far the three main explanations for the numerous PM10 exceeding values. From our experience, amongst the particles measured, only the results for Black Carbon (BC), mainly present in the lower submicron range, are reflective of the direct influence of local traffic. Measured at two traffic sites along with PM mass and number concentrations, the data for Black Carbon show a striking correlation with nitrogen monoxide, a parameter strongly related with the proximity of the local traffic. The correlation factor between Black Carbon data and NO or NO_x is much higher than between Black Carbon and the PM mass or number concentration. Therefore the assessment of traffic related particles should consider Black Carbon rather than PM10 or PM2.5.

KEYWORDS

Black Carbon, PM10, PM2.5, Particle Mass Concentration, Particle Number Concentration

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