

Little is known about the the relevance of mechanically produced particles of road traffic from abrasion and resuspension processes in relation to the exhaust pipe particles. Field measurements of PM10 and PM1 at the kerbsides of streets with different traffic regimes showed that mechanically produced particles represent an important fraction of the total particle emissions of road traffic.

Sites

- Aathal (speed 50)
- Birrhard (motorway A1, speed 120/80)
- Humlikon (motorways A4 and S6, speed ca. 85)
- Zürich Rosengartenstrasse (speed 50, slope 8%)
- Zürich Schimmelstrasse (speed 0-50, directly at traffic lights)
- Zürich Weststrasse (speed 0-50, ca. 50m from traffic lights)

Evaluation concept

$$d = \frac{EF_{LMW,NOx} \cdot n_{LMW} + EF_{SMW,NOx} \cdot n_{SMW}}{\Delta NOx}$$

$$\Delta PM1 = \frac{EF_{LMW,PM1}}{d} \cdot n_{LMW} + \frac{EF_{SMW,PM1}}{d} \cdot n_{SMW}$$

$$\Delta PM10 = \frac{EF_{LMW,PM10}}{d} \cdot n_{LMW} + \frac{EF_{SMW,PM10}}{d} \cdot n_{SMW}$$

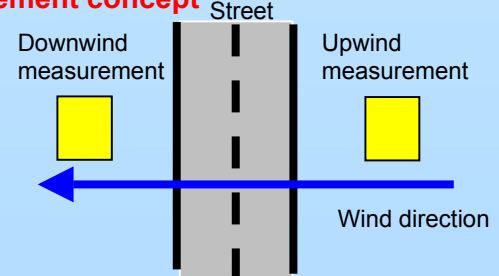
Emissions factors (EF) for PM10 and PM1 were derived for the two vehicle categories LMW (light vehicles < 6 m; i.e. petrol and diesel passenger cars, vans, motor cycles) and SMW (heavy vehicles > 6 m; i.e. lorries and coaches). For every hour a dilution factor (d) was calculated from the measured concentration differences of the nitrogen oxides (ΔNOx), the vehicle counts (n) and the emission factors for nitrogen oxides, which were supposed to be known. The emission factors for particles were calculated assuming the same dilution as for the nitrogen oxides.

$\Delta PM1$ was interpreted as direct exhaust pipe emissions and $\Delta PM10$ as total fine particle emissions. $\Delta PM10 - PM1$, thus, represents the emissions from abrasion and resuspension.

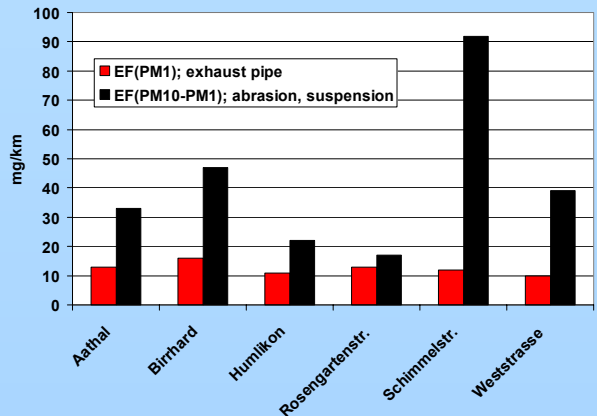
ACKNOWLEDGMENT

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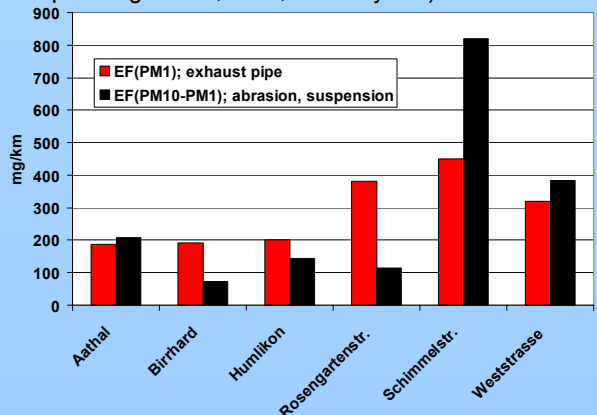
Measurement concept



Results



Mean emission factors for LMW (petrol and diesel passenger cars, vans, motor cycles)



Mean emission factors for SMW (lorries and coaches)