

## RELATIONSHIP BETWEEN THE CONCENTRATIONS OF PM<sub>2.5</sub> INDOORS OBTAINED BY USING THE OPTICAL AND GRAVIMETRIC METHODS: PRELIMINARY ANALYSIS

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### Abstract

The paper presents preliminary analysis of measurements of the mass concentrations of PM<sub>2.5</sub> in the indoor environment, obtained with the use of two optical instruments: (Grimm device and low-cost sensor) and a sampler based on the gravimetric method (SKC). It was found that the measurement of PM<sub>2.5</sub> using an optical device with active sampling underestimates the actual mass concentration of this mode (PM<sub>2.5</sub>), while measurement using an optical device with passive sampling of air overestimates the concentration of PM<sub>2.5</sub>. It has been shown that the physical relationship between the mass concentrations of airborne particles obtained with an optical sensor ( $C_{sensor}$ ) and concentrations obtained with the gravimetric method ( $C_{grav}$ ) is not linear. However, for practical reasons, the correct ("true") concentration levels of PM<sub>2.5</sub> in an indoor environment can be estimated by converting sensor data according to a simple linear equation, i.e.,  $C_{grav} = a C_{sensor}$ . The coefficient  $a$  for the sensor used was estimated at 0.45.

Keywords: PM<sub>2.5</sub>; Mass concentration; Gravimetric method; Optical method; Low-cost sensors; Indoor air.