

A new device for continuous unattended measurements of UFP

M. Pesch¹, H. Grimm², R. Albrecht³, A. Edfelder⁴,

Grimm Aerosol Technik GmbH & Co. KG, 83404 Ainring, Germany

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Presenting author email: mp@grimm-aerosol.com

Although ultrafine particles account only for a little share in the total mass concentration, they are under a cloud of being harmful to health (Wichman und Peters, 2000). For this reason an additional monitoring of this particle fractions' exposure is absolutely necessary. First steps of continuous measurements of ultra fine particles have already been realized in our systems like the Grimm 665 Wide Range Aerosol Spectrometer. Due to the temporal resolution of the integrated mobility spectrometer (SMPS) as well as its comparatively high costs it is unsuitable for an area-wide monitoring of the total particle concentration. A more competitive alternative for measuring the particle exposure in the nanometer range and simultaneously having a high temporal resolution of 1 second is a our special environmental Condensation Particle Counter (CPC).

We present a new system (465 UFP) which is based upon the Grimm CPC 5.4 product line, and is absolutely qualified for continuous measurements of the particle exposure in the nanometer range. The device is performed for long term unattended measurements, e.g. in measurements networks or at hot spots (Figure 1).

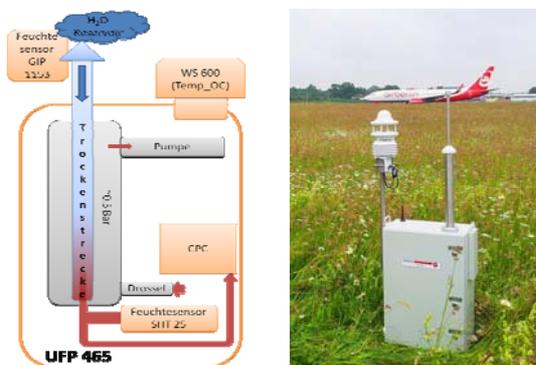


Figure 1: Schematic assembly of the 465 UFP (left) as well as a field measurement at the airport Hamburg (right)

Count efficiency, dryer performances and particle losses in the inlet pipe have been characterized comprehensively and comply by now with the already existing recommendations of the standard working group CEN/TC 264/WG 32 for an environmental CPC.

On the basis of field measurements next to the runway and the A1 (German Autobahn 1) near Osnabrück the impressive performance as well as further fields of application of the 465 UFP will be introduced and discussed.

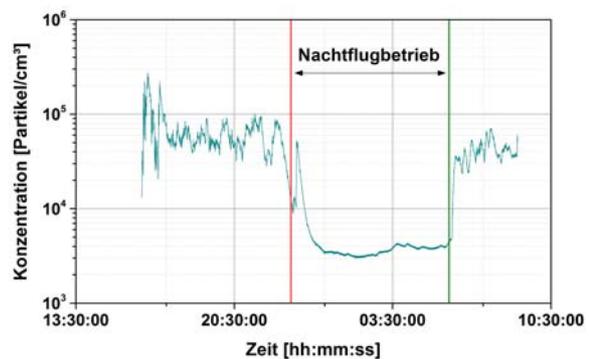


Figure 2: Temporal development of the particle exposure next to the runway of the airport Hamburg.

H. E. Wichmann und A. Peters (2000),
Epidemiological evidence of the effects of ultrafine particle exposure, *Philosophical Transactions of the Royal Society of London, Series a, Mathematical Physical and Engineering Sciences*, 358 (1775): 2751 _ 2768, 2000.