



GRIMM Aerosol Technik Newsletter

Fast Aerosol Particle Emission Spectrometer (FAPES)

GRIMM is the leading European manufacturer

of aerosol measurement solutions for more than 30 years, and produces solely in Germany. Due to many requests we have developed a wide range of different Aerosol Spectrometers for measurements of all aerosols between 5 nm and 32 µm in over 70 size channels.

However, the industry requested faster technology with sampling rates up to 10 Hz and more, for applications such as automotive, industrial processes, printer emissions, etc. where repeatability and reproducibility are of utmost importance.

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FAPES Concept

is based on absolute physical measurements (currents), where no calibration is needed. The system allows the full aerosol spectrum between approx. 5 nm and 500 nm in 25 size channels and with a time resolution of 10 Hz. Fast changes of aerosol concentrations and compositions, that can not be measured with a classical SMPS approach, can now be observed.

Therefore, the new GRIMM FAPES is the reference system for all other aerosol emission measurement devices. Despite the complexity of the system, the FAPES has low service and maintenance.

This newly introduced system is comprised of twelve Differential Mobility Analyzers (DMAs) of "Vienna"-type design, twelve fast and ultra low noise Faraday Cup Electrometers, each directly attached to a DMA, a fully integrated sampling and dilution system, a bipolar charger and a fully integrated control system for air flow and DMA voltages and many more outstanding features. [More...](#)

GRIMM and the FAPES at the EAC in Manchester

Having the FAPES at display straight out of R&D we were pleased with the interest and the feedback we received from the show floor. There was not only interest from the scientific scene looking into combustion processes, but also from industry with a focus on smoke and fumes. The FAPES on

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Dr. Markus Pesch: In charge of the development of the FAPES

EDITORIAL NOTE

Developing new devices is a big challenge. The first prototype FAPES Fast Aerosol Particle Emission Spectrometer was put through serious testing as early as 2008. The results were so exciting that we decided to give the FAPES an extra edge. Come and see this new development.

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display was equipped with a high temperature particle inlet, which raised interest from the volcano society. Their interest is on the disperse Aerosols during eruption processes. The broad spectrum of topics which may be investigated with FAPES prove that we have invested our R&D time in the development of a very versatile tool. We look forward to many interesting applications to come. [More](#)



The EAC in Manchester with FAPES (right to left), SMPS+C with an "Vienna"-type DMA, an OPC1.109, an EDM107 and an EDM164 with an SVC sampling probe and meteorological Samplers.

For information on our experiences with our prototypes and for on site introductions to the new FAPES instrument contact GRIMM, a dealer in your country or visit our Website and a Webinar.

Applications

- Measurements in engine exhaust
- Combustion studies
- Monitoring of dynamic processes with nanoparticles
- Reference system for fast particle sizers

Some Highlights

- Sampling rate up to 10 Hz
- Size range 6.3 - 474 nm
- Integrated hot dilution, Neutraliser, and 12 "Vienna"-type classifiers with Faraday Cup Electrometers
- Insensitive to soot contamination
- Tolerates positive and negative pressure
- Reliable results without calibration
- Self-tests to assure highest reliability
- Full size resolution for the range in which other fast instruments fail (>~200 nm)

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