

WIBS-5

Wideband Integrated Bioaerosol Sensor



Outcome

The WIBS-5 from Droplet Measurement Technologies is the world's only instrument for real-time, single particle measurement of the fluorescing and morphological properties of atmospheric bioaerosols like bacteria, fungi and pollen. Health specialists need much more detailed information on the spatial and temporal distribution of bioaerosols because of their potential for tremendous impact on human health; as many seasonal allergy sufferers can attest to. With its particle-by-particle characterization of particles into as many as seven types of wavelength-dependent fluorescence, the WIBS-5 can identify trends and patterns in the behavior of bioaerosols at time and spatial scales much finer than filter-based measurements can capture. The unique pairs of excitation and emission wavelengths used to induce fluorescence allows researchers to gain insight as to the sources of bioaerosols and how their concentration and properties are related to meteorological conditions and solar radiation. With this insight forecasts of health risks related to bioaerosols can be greatly improved.

Overview

The WIBS-5 measures fluorescence to infer the presence of biological material in particles and provides detailed data on size, relative measure of shape, and fluorescent properties to enable classification of pollen, bacteria, and fungi. There is often a question pertaining to speciating different bioaerosols; the WIBS does a good job at determining between non-biological and biological particles of origin. There are several publications that look at the speciation abilities of the WIBS (4A model, but the WIBS-5 design is similar). The ability to discriminate different particle types with the WIBS is still being studied by several researchers, but there are studies to suggest the WIBS may be able to broadly discriminate between particle types e.g. pollen vs fungi vs bacteria

Applications

- Bioaerosol research (mold, pollen, fungi)
- Air quality studies
- Health effects research
- Waste management
- Pollution characterization
- Cloud physics research

Advantages

The WIBS-5 provides three pieces of information on a particle-by-particle basis; fluorescence, size and asymmetry factor information. The data is not time averaged and the user receives particle-by-particle information; including a timestamp when the particle hits the detection laser. The WIBS-5 is capable of measuring up with 3,000 particles/L for full measurement (10% coincidence). The XE flash lamps can see max 15 particles/sec and can see as little as no particles per second. The WIBS-5 provides particle-by-particle measurements, and it is very well suited to investigate how air flow, ventilation, and meteorological parameters affect the fluorescent particle concentration which can be ideal for an indoor air space. The WIBS-5 provides researchers with near real-time measurements and is suitable for ground or airborne applications.



Product Specifications

Measured Parameters:

- Single particle light scattering
- Single particle fluorescence (three emission wavelength bands)
- Particle size
- Particle asymmetry factor (AF)

Derived Parameters:

- Particle concentration
- Particle size range: 0.5 μm to 30 μm
- Maximum concentration: 466 particles/cm³ for fluorescent particle counting (10% coincidence), 9,500 particles/cm³ for sizing and counting (10% coincidence)
- Fluorescence excitation: Dual Wavelength, 280 nm and 370 nm
- Fluorescence detection: Dual Waveband, 310-400 nm and 420-650 nm
- Flow rate: Sample Flow: 0.3 L/min, Sheath Flow: 2.1 L/min

Environmental Operating Conditions:

- Operating temperature: 5°-40°C
- Storage Temperature Range: -40°C to 70°C
- Relative humidity: 5% to 90%, non-condensing
- Maximum aerosol sampling Altitude: 12192m (40,000 ft) – Instrument contained in pressurized aircraft
- Maximum operating altitude: 0 to 2000m
- IP54 rated

Weight:

- Instrument: 12.7kg
- Dimensions:
 - 17.825"W x 14.825"L x 11.5"H (with inlet)
 - 45.3 cmW x 37.7 cmL x 29.2 cmH (with inlet)

Data System and Power Requirements:

- Data system: Embedded computer Intel Core i7 6600U Dual Core 2.6Ghz 8.0G Ram Windows E7 64bit
- WIBS Software and WIBS Toolkit included
- Power requirements: 100 - 240V ~ 3A 50-60Hz

Available Accessories

- Aerosol generator w/ PSL's
- Science Care Program
- 1 and 2 Year Extended Warranty
- Lifecycle Care Program

The Droplet Guarantee

Droplet understands how the versatility and performance of an instrument can impact your research, career, and the world we live in. As you strive to provide a better understanding of our planet, we guarantee to be here to support you through your journey.

Whether you are establishing your first laboratory or are a tenured researcher; we have a team of scientists, engineers, and technical staff available to assist with application questions, technical support, data analysis, and training.



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