BCPD

Backscatter Cloud Probe with Polarization Detection

Outcome

The BCPD is the only commercially available, flush-mounted, non-intrusive sensor that can measure the high ice crystal concentrations that have been the cause of obstructed temperature/air speed sensors, engine rollback and even flameout. The BCPD is also unique in its ability to measure supercooled, liquid water concentrations in the presence of ice crystals in high flow airborne and ground-based conditions where measurements must be made unobtrusively and where space constraints are high, for example on UAVs. The quantification of supercooled water droplets, in the presence of ice crystals, is essential for meeting the FAA, Appendix O requirements for commercial aircraft below 60,000 lbs. The measurements obtained from the BCDP can alert pilots when they are in possible airframe icing conditions or high ice crystal concentrations, enabling them to take immediate corrective action to avoid loss of control with subsequent damage to the aircraft and its passengers.

Overview

The Backscatter Cloud Probe with Polarization Detection (BCPD) measures cloud droplet size distributions, whih are then used to derive the total number concentrations, liquid water content, median volume diameter, and effective diameter. The BCPD's non-intrusive optical housing allows use in a range of ground-based or airborne applications with no contamination from ice crystal shattering and no airflow distortion.

Applications

- Cloud particle research
- Climate studies
- Aircraft icing
- Cloud chamber applications
- Fluid contamination detection
- Tower applications

Advantages

The BCPD's aerodynamic design minimizes disturbance and allows for undisturbed particle measurement. The instrument is roughly the size of of a human hand, is easily mounted on an aircraft, and sits flush within a window or panel. It can still be used in any application where droplet size measurements are needed, but space and power are at a premium.

Product Specifications

Measured Parameters:

- Single-particle light scattering:
  - S polarized back-scattered light
  - P polarized back-scattered light
- Temperature
- Pressure

Derived Parameters:

- Particle diameter
- Particle number concentration
- Liquid water content (LWC)
- Effective diameter (ED)
- Median volume diameter (MVD)
- Particle size range: 2µm-50µm
- Number of size bins: 10, 20, 30, 40 (configured at time of purchase). User selectable boundaries
- Number concentration range: 0-1000 particles/cm3
- Sampling frequency: Selectable, 0.04 sec to 20 sec

Environmental Operating Conditions:

- Temperature: -40°-40°C
- Altitude: 0-15,000 meters
- Relative humidity: 0-100% non-condensing
- IP54 rated, robust for a wide range of weather conditions.
- Airspeed range: 10-250m/sec

Data System and Power Requirements:

- Data system interface: RS-422 serial interface
- Electronics box and 1m connecting cable (included)
- Software: Particle Analysis and Display System (PADS) Software (included)
- Power requirements: 28VDC, 5A for heaters and system

Weight:

- Probe: 14.6cm x 13.3cm x 5.1cm with 5.9cm mounting flange
- Electronics box: 21.7cm x 12cm x 8.2cm

Available Accessories

- 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.