

Phase Doppler Interferometer



PDI-FP

Phase Doppler Flight Probe System

Stable

Compact

Rugged

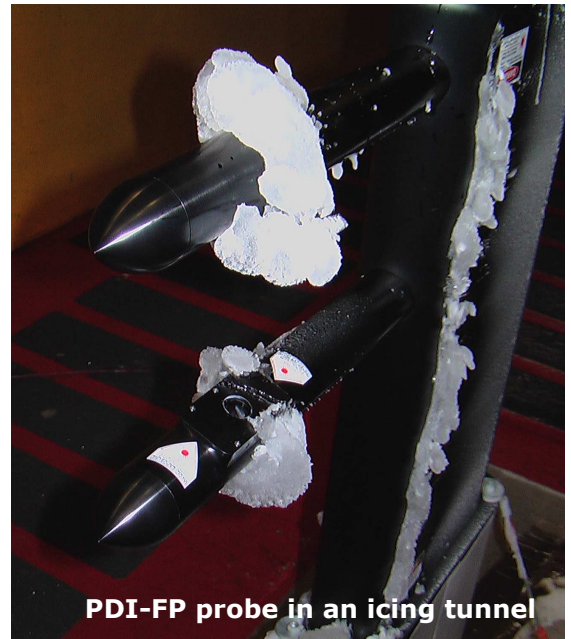
Turnkey

Automatic Setup

The **phase Doppler flight probe system** offers turnkey operation with a fully automated setup feature. The flight probe system can be used for the real-time, non-intrusive measurement of individual droplet size and single velocity component in a variety of flight and wind-tunnel applications. The complete instrument includes the flight probe (including the optical transmitter and receiver), ASA signal processor, and the AIMS system software. The high powered DPSS laser used in the probe provides stability, compactness, ruggedness, and high reliability; it eliminates the need for inefficient and unreliable fiber optics. The PDI-FP system has optional built-in heaters to prevent ice accretion around the optical windows. This allows the flight probe to be used under extreme icing environments without any signal loss. **Dual range probes** with a dynamic range of 1:1500 μm are also available. The Fourier transform based **Advanced Signal Analyzer (ASA)** incorporates a proprietary signal burst detection technique and adaptive Doppler burst sampling approach to provide improved accuracy in signal detection and measurements. The **Automated Instrument Management System (AIMS)** provides fully automatic setup and operation of the instrument. It also offers remote operation and monitoring via the Internet.



Two PDI-FP probes mounted on a Twin-Otter



PDI-FP probe in an icing tunnel

Technical Specifications



PDI-FP

Drop size measurement range	0.5 to 1000 μm or larger
Estimated accuracy	+/- 0.5 μm
Estimated resolution	+/- 0.5 μm
Velocity measurement range	-100 to 300 m/s
Velocity accuracy	to +/- 1%
Volume flux accuracy	to +/- 15%
Receiver focal length	150 mm
Transmitter focal Length	150 mm
Laser type	Diode pumped solid state (DPSS)
Wavelength	532 nm, 660 nm



ASA

Processor bandwidth	5-150 MHz
Input voltage	200 mV to 1V
Minimum transit time	100 ns
Max sampling frequency	Quadrature, 320 MHz
Measurement accuracy	0.02% of the sampling frequency (frequency) 0.5 degree (phase)
Minimum SNR	-6 dB
Maximum data rate	100,000 per second
Number of samples	Adaptive 16 to 4096 quadrature
Burst detection	Phase domain burst detector Quadrature analog burst detector
Run time	32 bit, 0.5 μs resolution
Transit time	16 bit, 0.1 μs resolution