

NASA IMPACTS Field Project: Introduction to Measurement Systems

David Delene



Project Collaborators

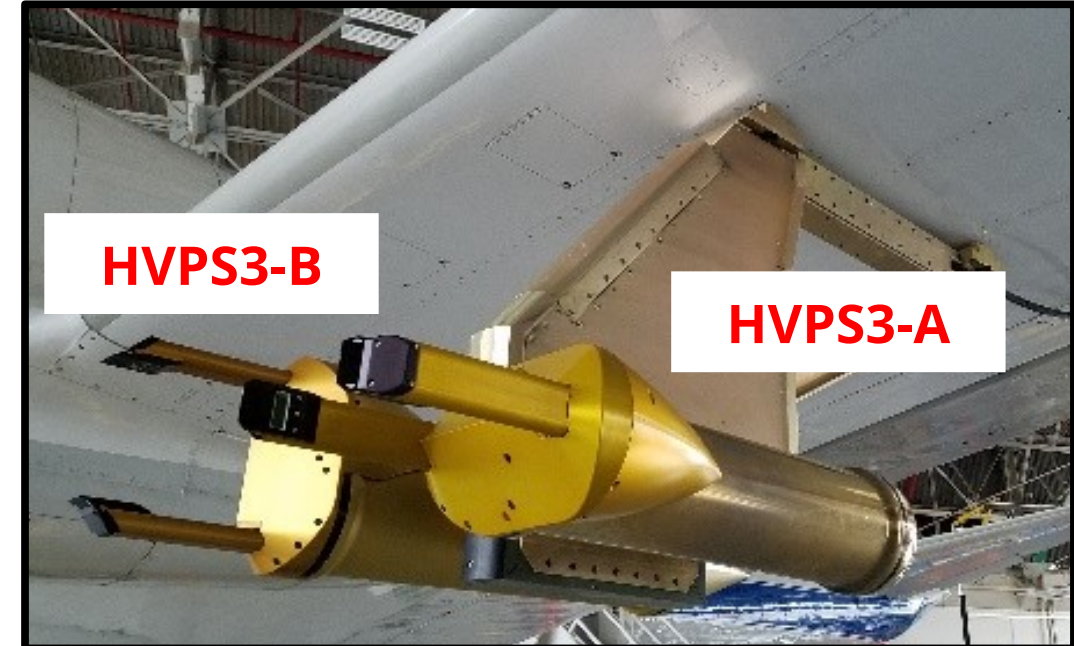
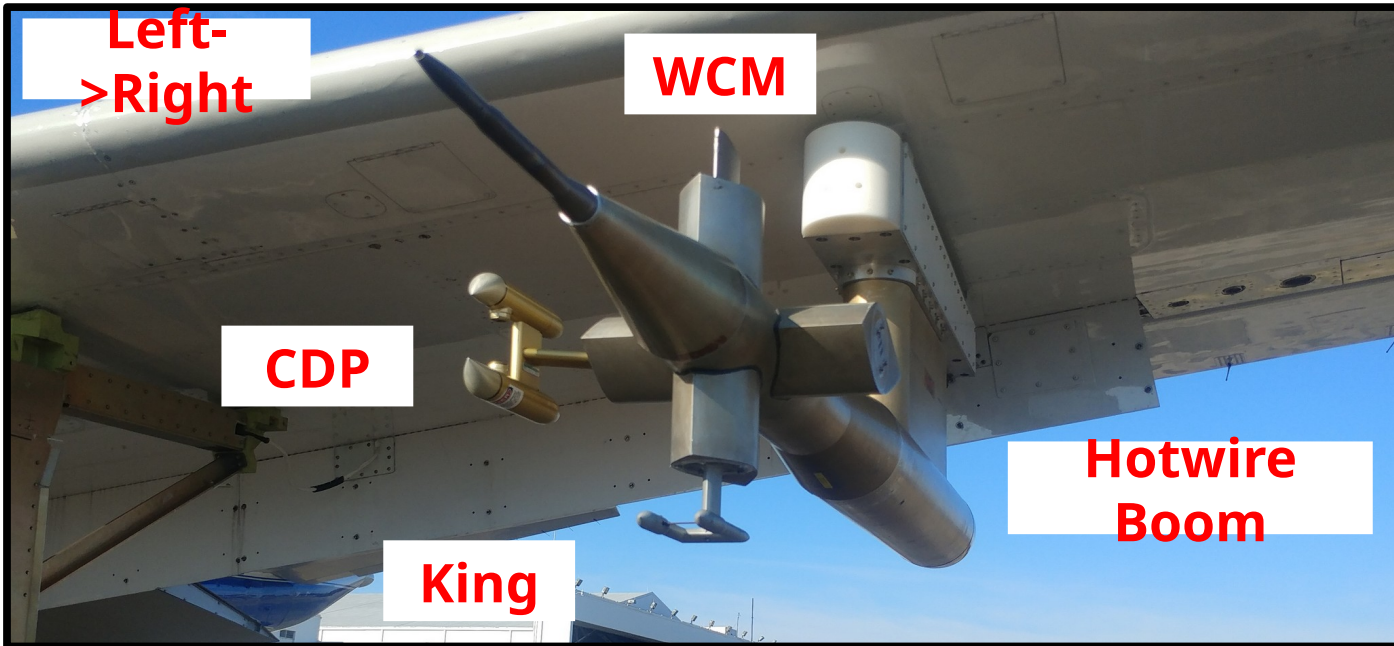
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Overview of Cloud Probes on P3 Aircraft



Left-
>Right

IMPACTS 2022 Cloud Probes



IMPACTS 2022 Cloud Probes

Measurement Size Range

1 μm

10 μm

100 μm

1 mm

10 mm

CDP (2.0-50.0 μm)

FCDP (2.0-50.0 μm)

CPI (2.3 μm to 1 mm)

PHIPS (3 μm to 2 mm)

2DS (10/50 μm to 1.280/6.400 mm)

HVPS-3 (150 μm to 19.2 mm)

King (wire) (LWC for 5 to 200 μm)

WCM (wire) (LWC for 5 to 200 μm)

Rosemount Ice Detector (RICE) (SLW)

Measurement Method

Forward Scattering Probes

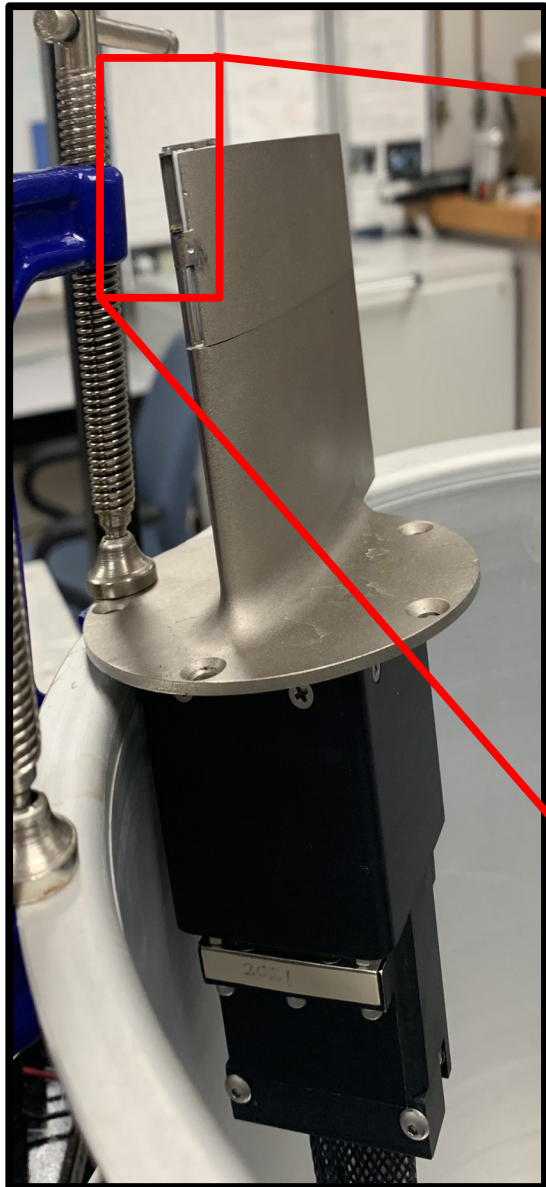
Imaging Probes

Hot-wire Probes

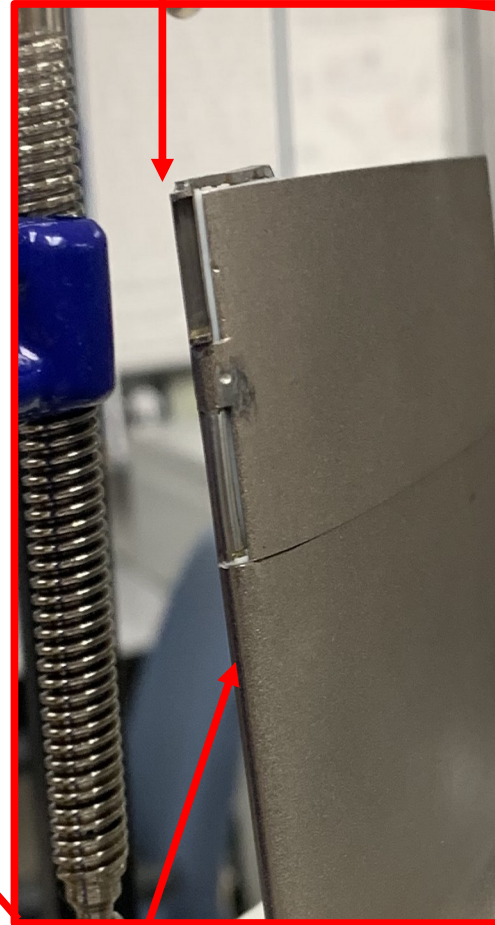
Vibrating Cylinder

WCM - Total Water Content System

Science Engineering Associates (SEA) Model WCM-3000

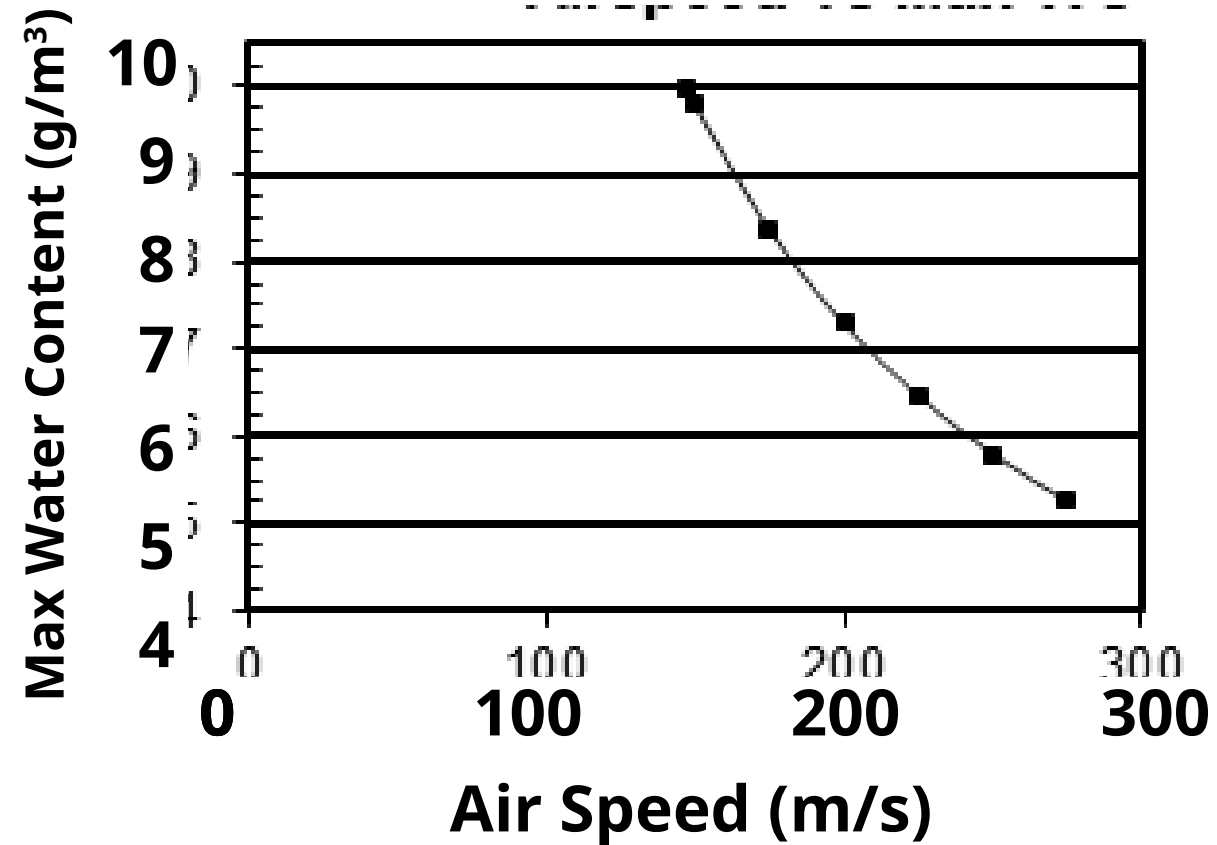


Total Water



Liquid Water

- 140 °C Sensor Temperature



Research Flights - 2022

01-11	01-14	01-17	01-19	01-29	02-03	02-04	02-08	02-13	02-17	02-19	02-22	02-25
Cal.	Banded Structur es Northwe st of a Departi ng Rapidly- deepeni ng Cyclone off Cape Cod with a GPM Overpa ss	Intens e High- Impact Storm with Freezi ng Rain at Pope and Bandin g across NW New York State and Canad a	Warm- frontal Bands and Genera ting Cells in an Alberta Clipper in Canad a	Departi ng strong nor'ea ster								

Instrument Issues and Performance

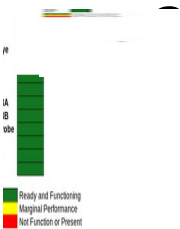
09/29/2

1

Wired Incorrectly, Power Board Failed (both Channels)

02/28/2

Probe Tip Leak



2D-S
Hawke
ye
FCDP
2D-S
CPI
HVPS-
3A
HVPS-
3B
CDP
King
WCM
RICE
PHIPS

DSP Board Failed, Sent to SPEC for Repair

Capacitor In Probe Head Failed, Used Replacement CDP
M300 Failed During Flight, Replacement System Until Repaired

Flight Operations



Questions and Comments

