Processing and Analysis of P-3 Aircraft Cloud Probe Data

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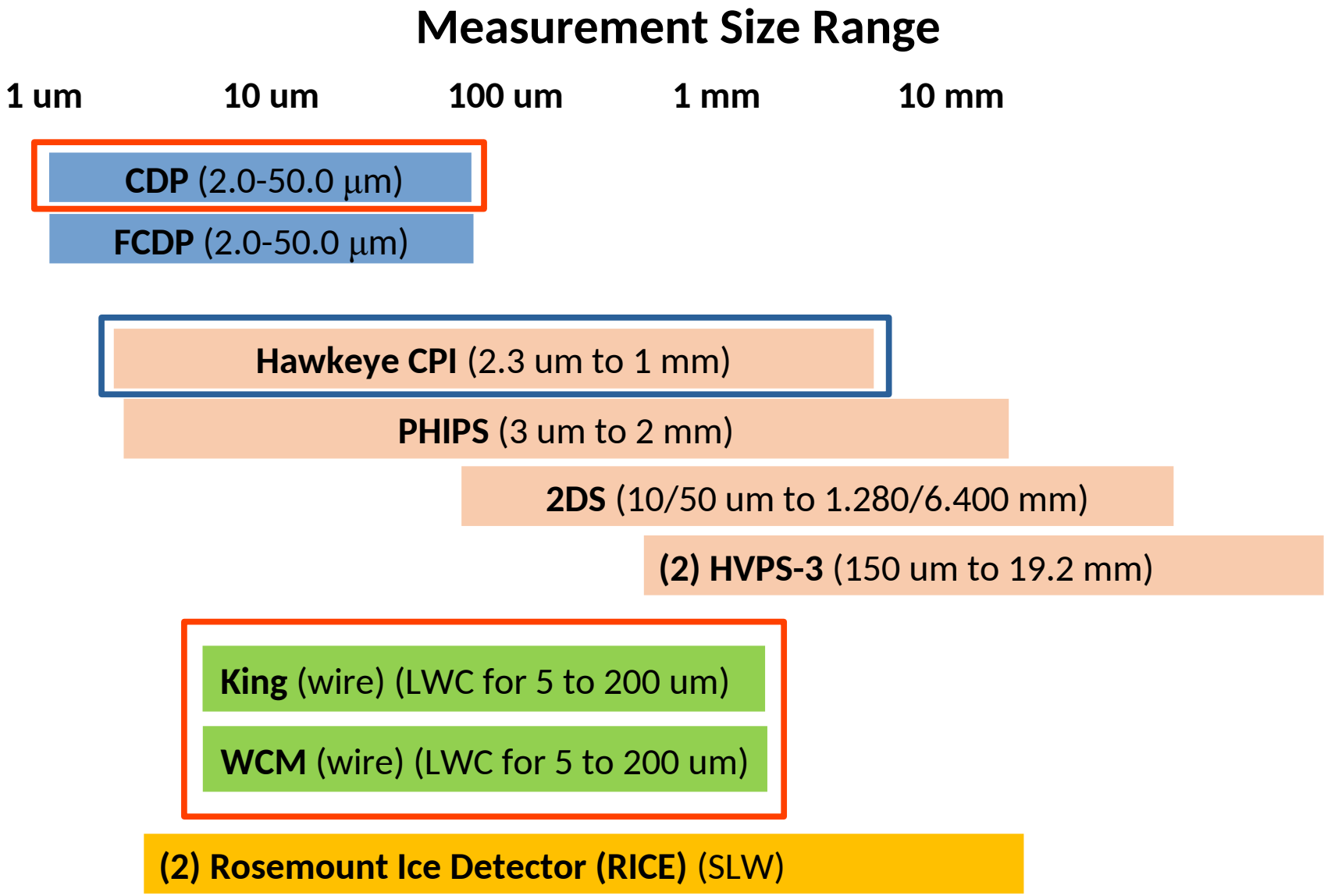
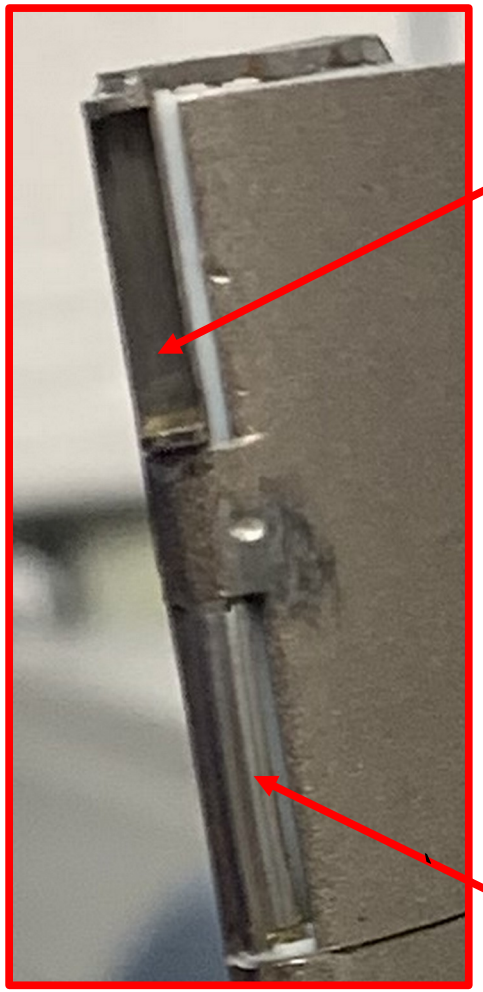
IMPACTS 2023 Cloud Probes



Christian Nairy

Jennifer Moore



Total Water

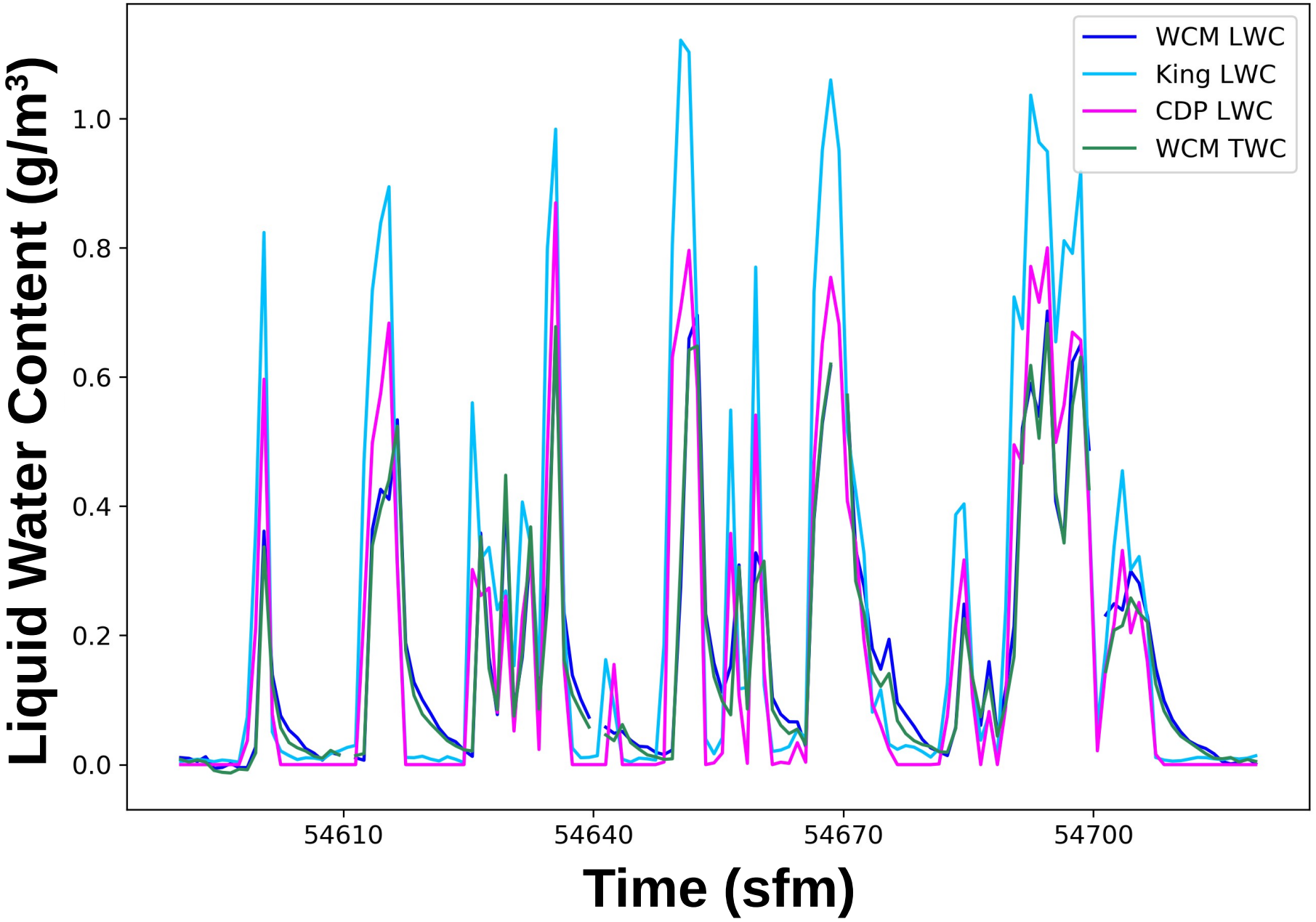
Liquid Water

Hawkeye (CPI)

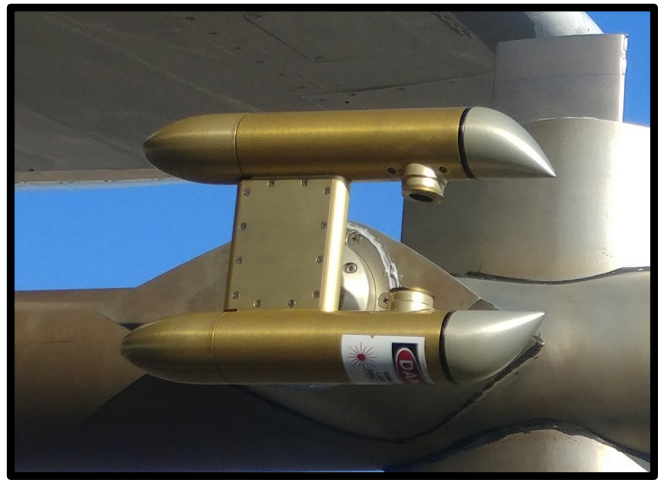
WCM-3000

WCM-2000

2020/12/12 Liquid Cloud 1 Hz Measurements

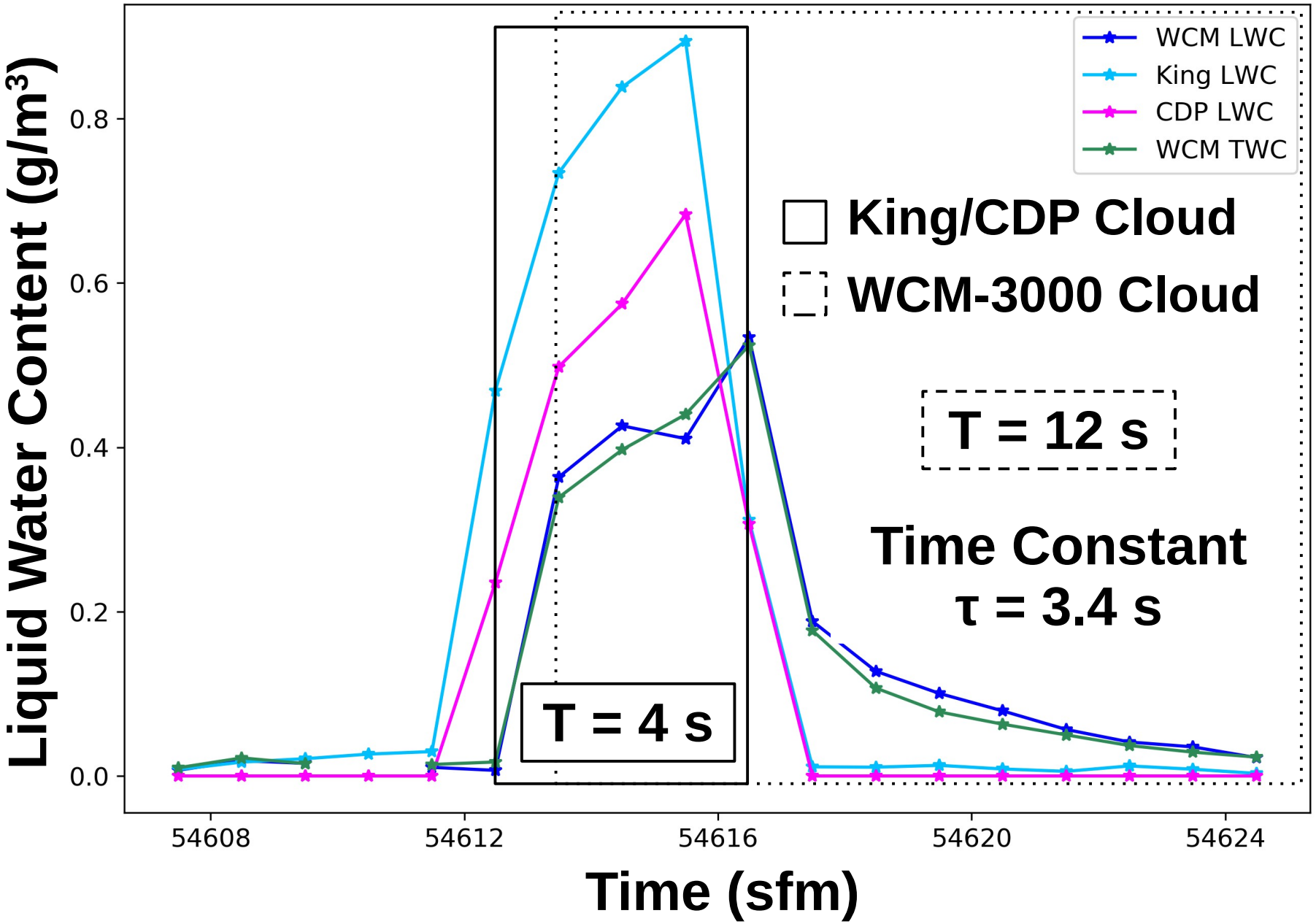


CDP



King Probe

2022/12/12 Liquid Cloud 1 Hz Measurements



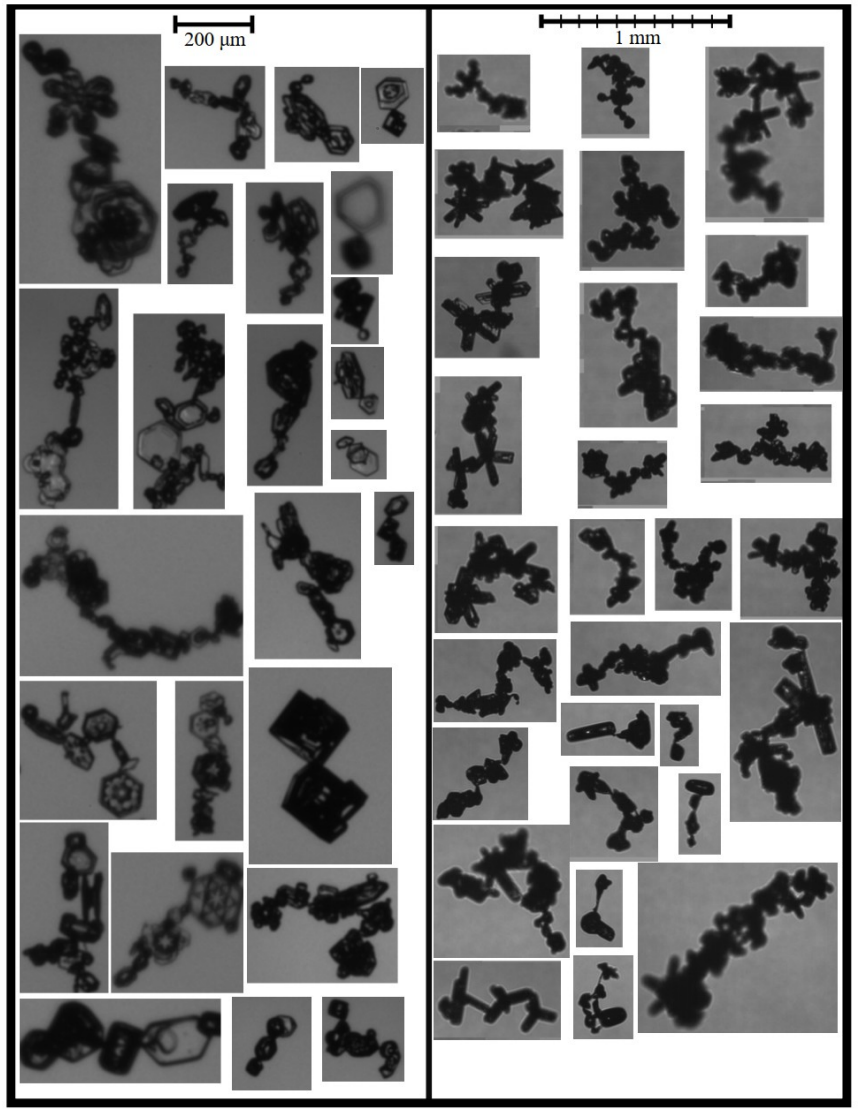
WCM-3000

WCM-3000 Time Response

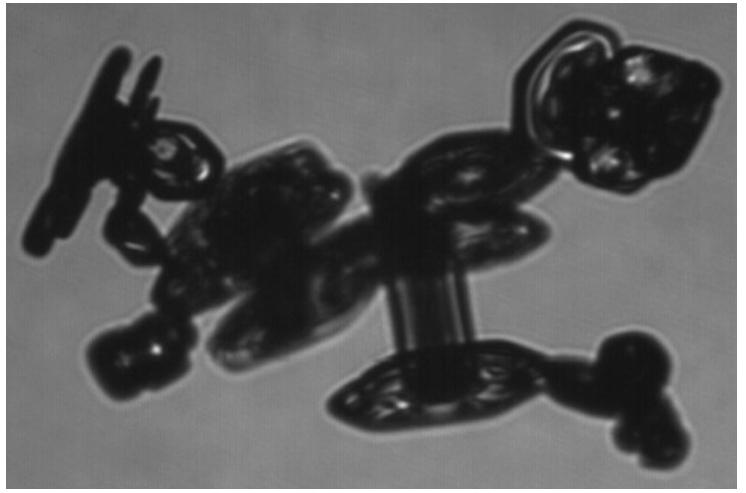
- The WCM-3000 time response is much slower than the King Probe.
  - The WCM-2000 has a similar time response.
  - Icing tunnel measurements has a similar time response.
- The WCM/King difference is likely related to the wire type.
  - Solid wire (WCM) compared to coiled wire (King Probe).
- Need to develop processing method that adjusts WCM measurements based on the slower time response.

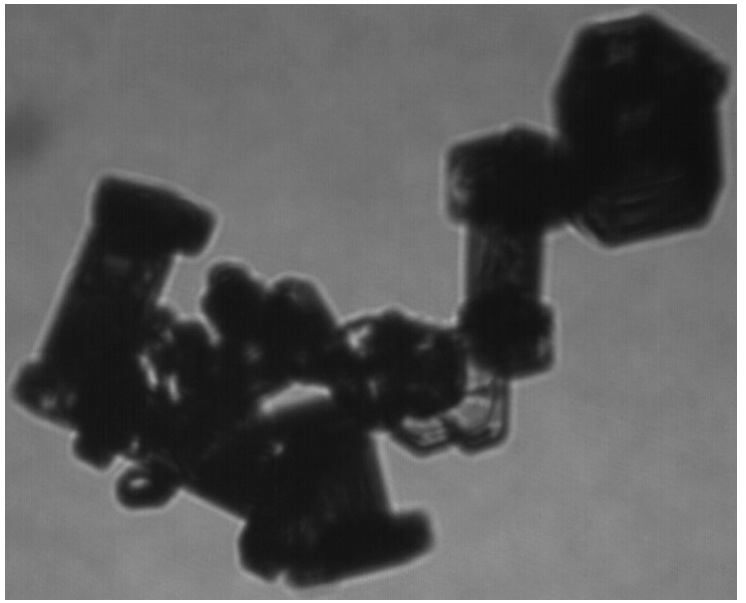
15 January 2023 Case Study (Chain Aggregates)

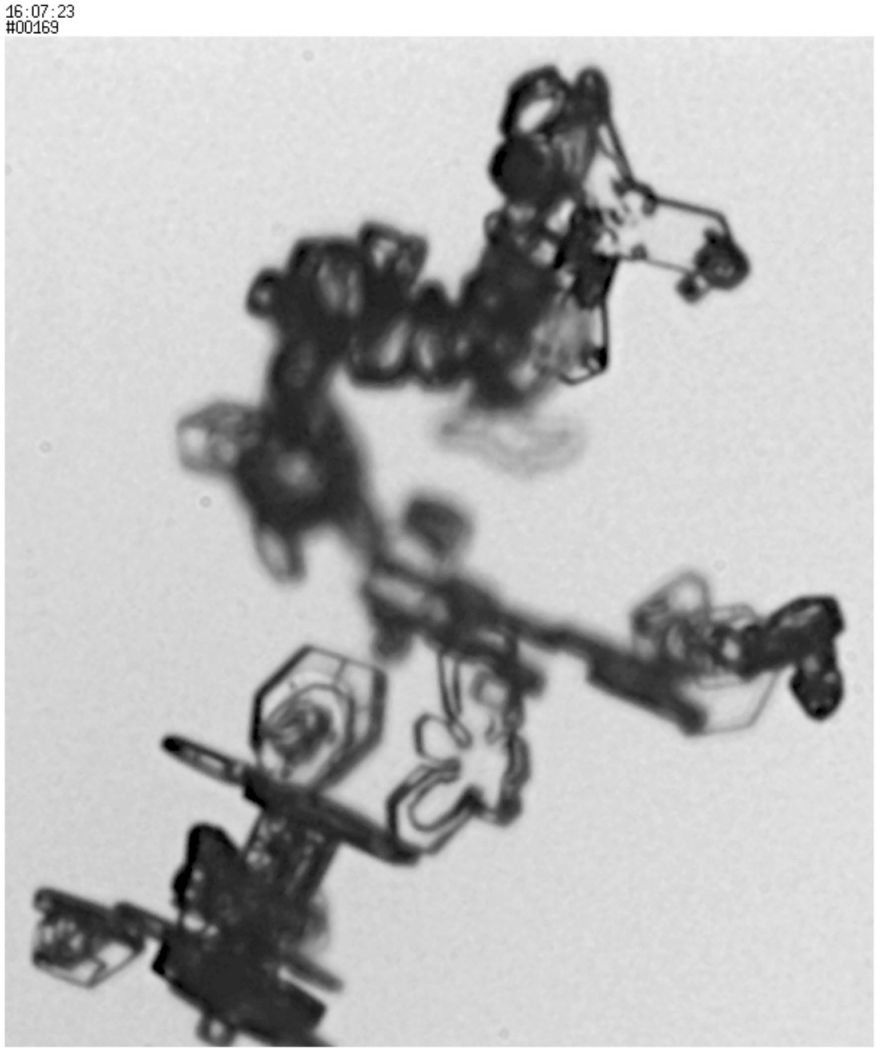
(Relating In-situ to Remote Sensing Observations)



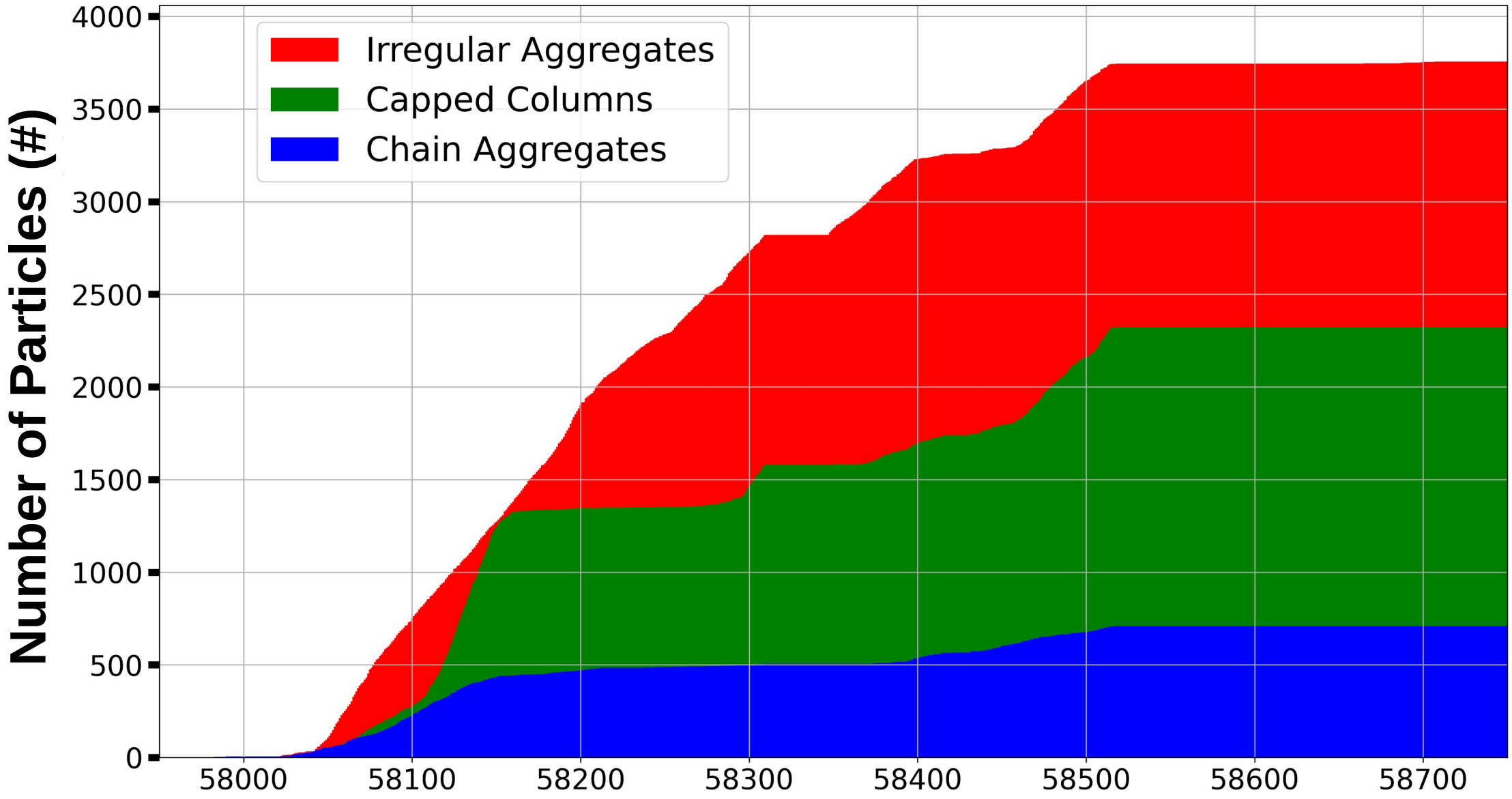
CapeEx19 IMPACTS







Cloud Particle Imager (Hawkeye-CPI)



3700

2400

600

13 min

15 January 2023 Analysis

- Related in-situ microphysical observations from the P-3 to the remote sensing observations of the ER-2.
  - There are very interesting changes in both microphysic, location of chain aggregate, and changes in radar observations.
- Software is being developed to enable manual classification using image processing method and habits similar to the PHIPS classification.
  - Three people conducting manual habit classification.
  - Three AI habit classification (CPI, PHIPS, and CPI+PHIPS).

Summary and Future Work (Papers)

- WCM-3000 Processing Methodology and Uncertainties
  - Jennifer Moore – Poster #4
- 15 January 2023 Case Study
  - Christian Nairy – Poster #7
- CPI and PHIPS Manual and AI Habit Classification
  - AMS 2024 Conference Presentation