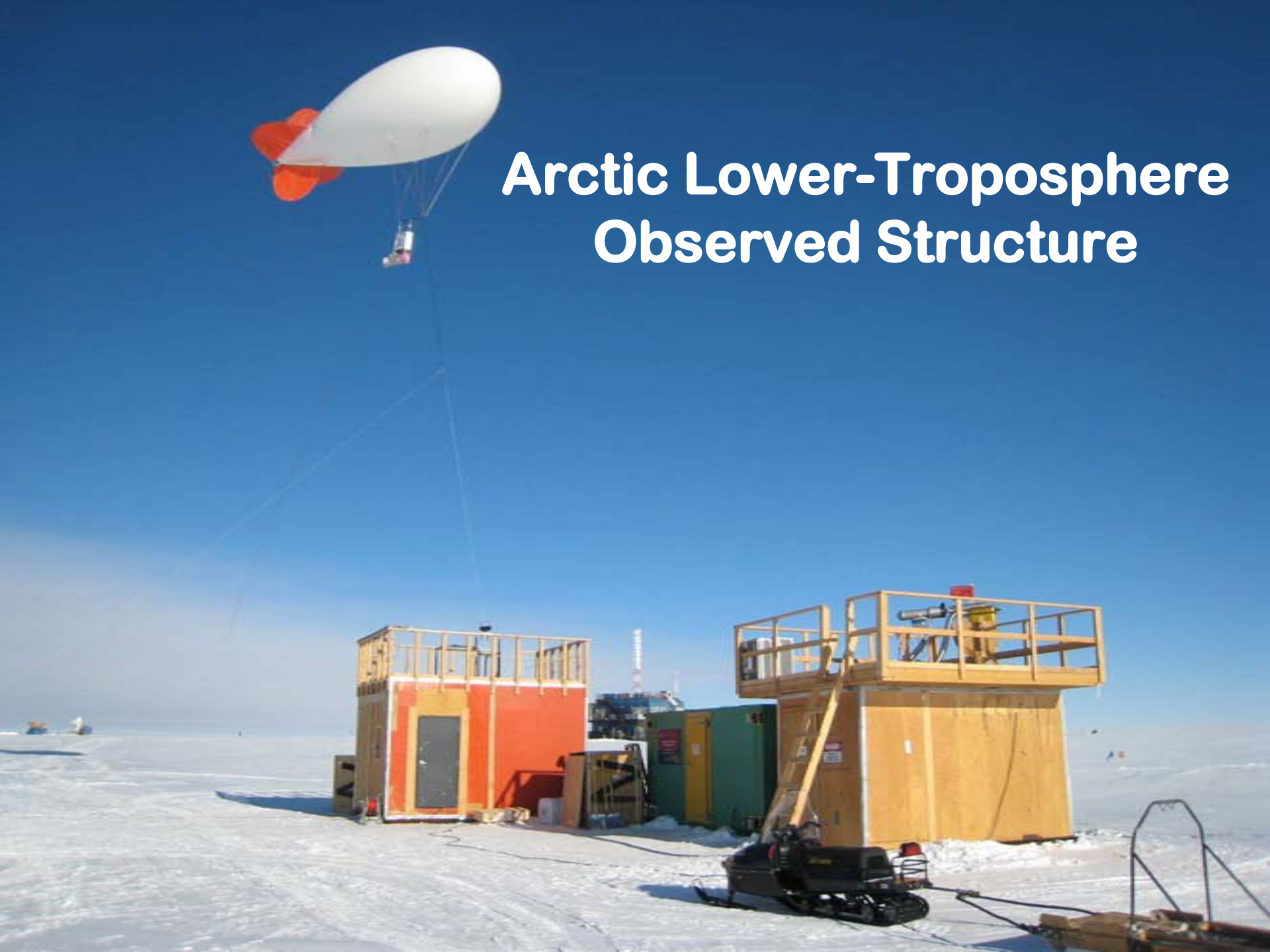
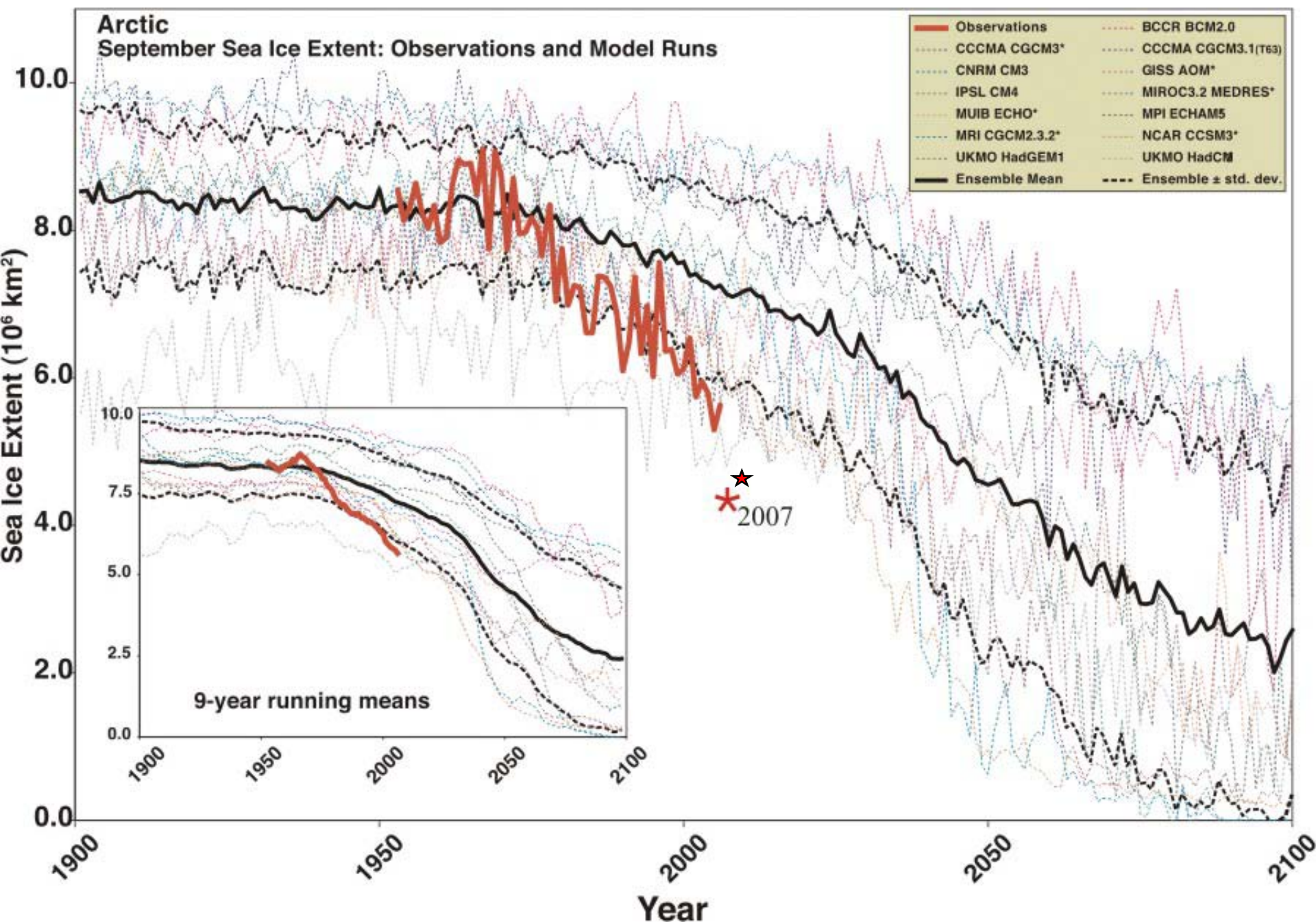


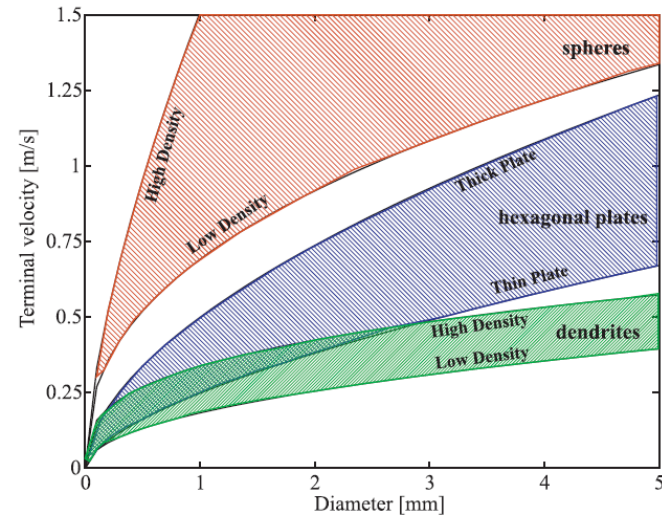
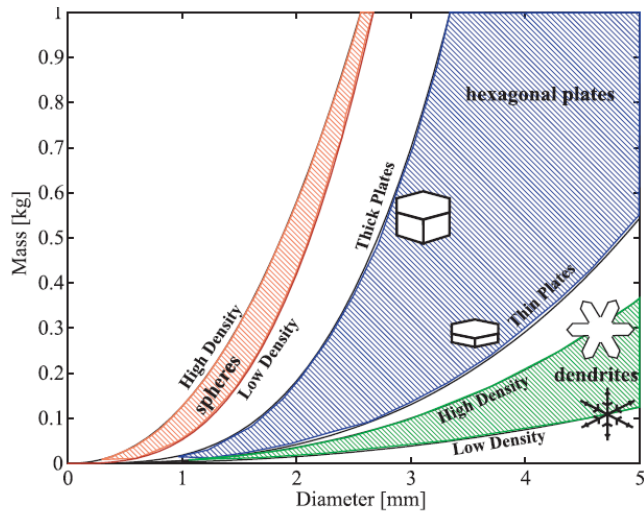
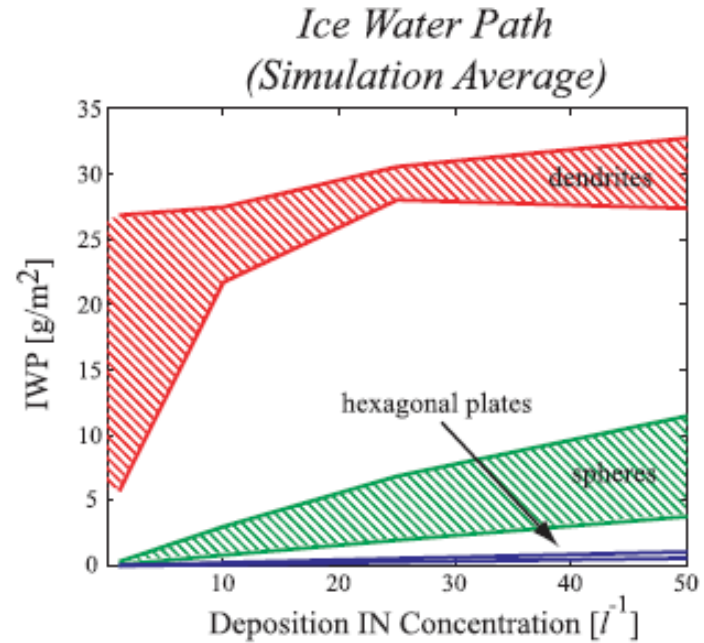
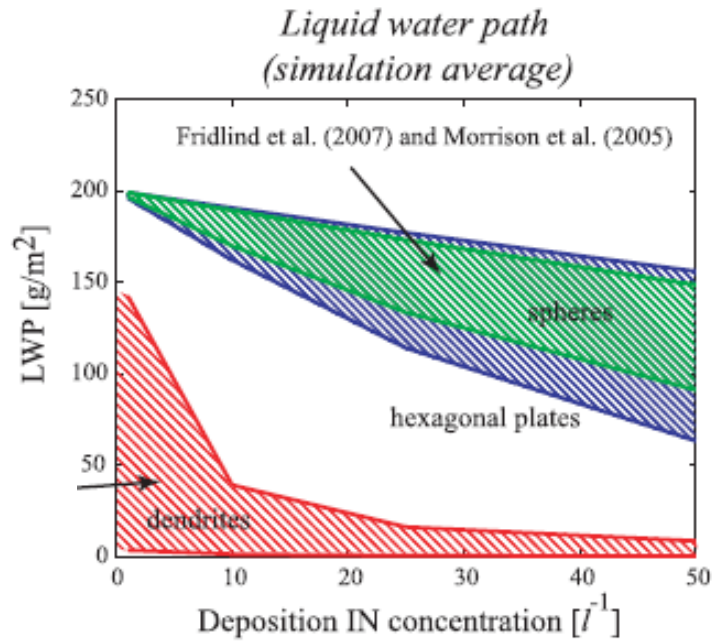
# Arctic Lower-Troposphere Observed Structure



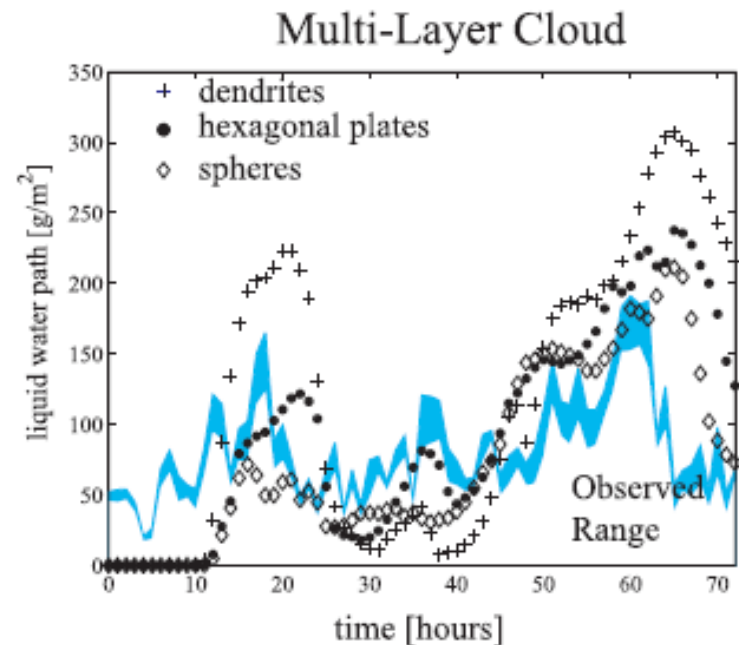
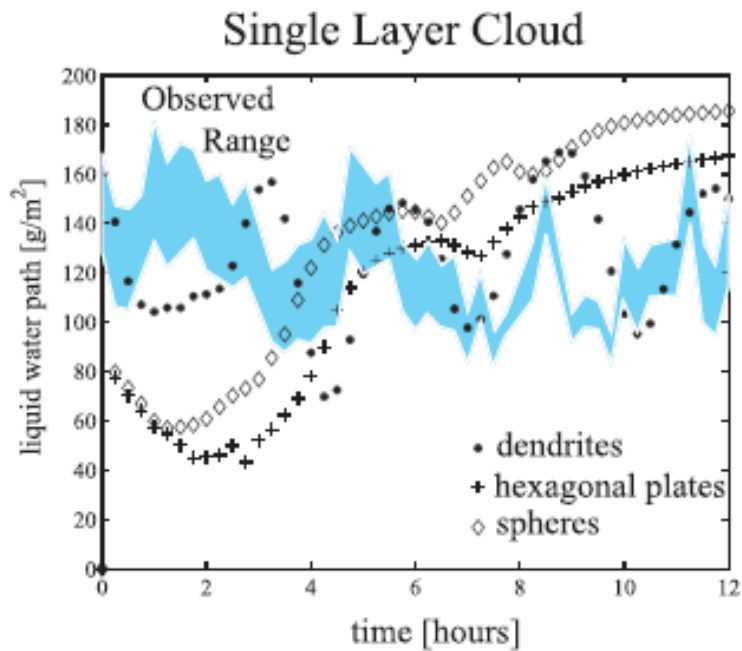




# Different Habit Parameterizations: Different ice concentration sensitivity



# - Habit Impacts -



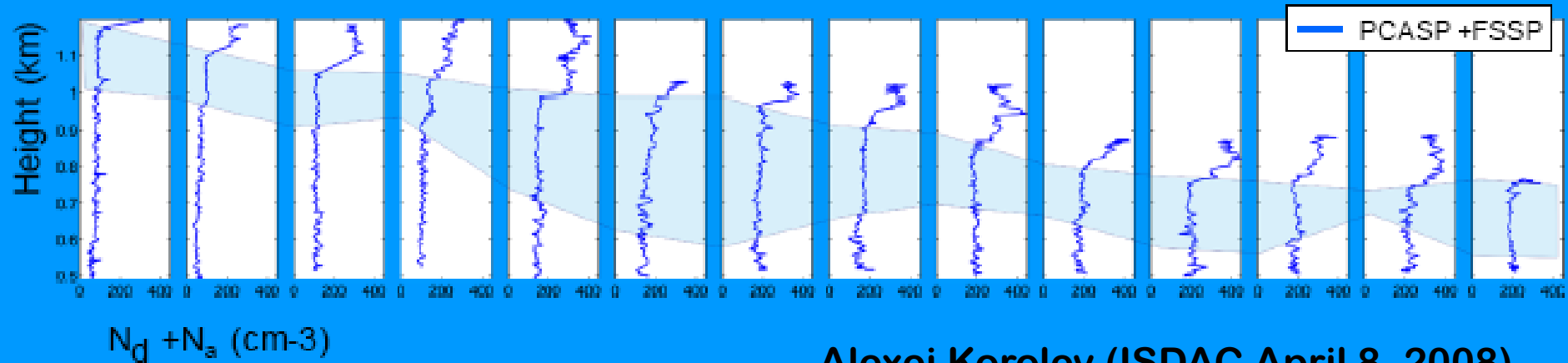
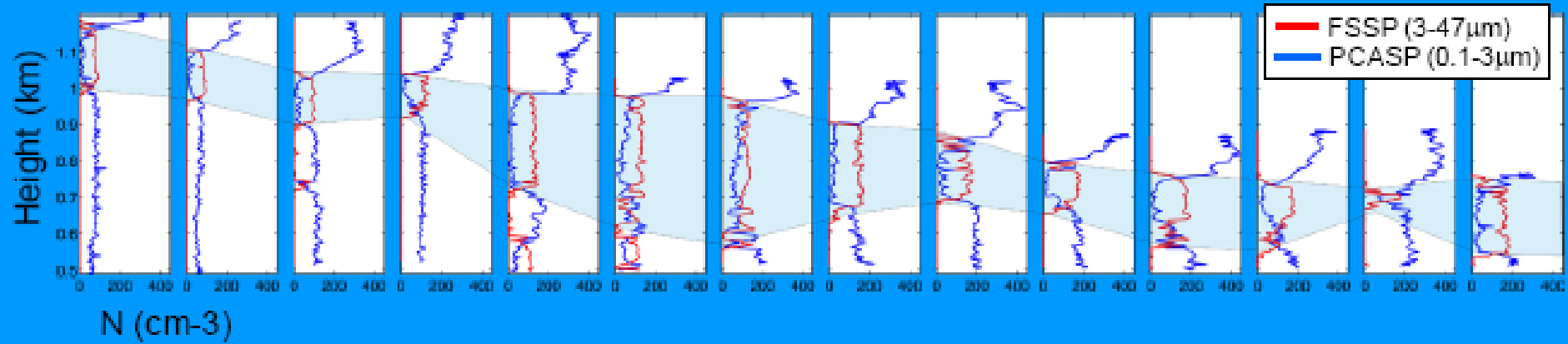
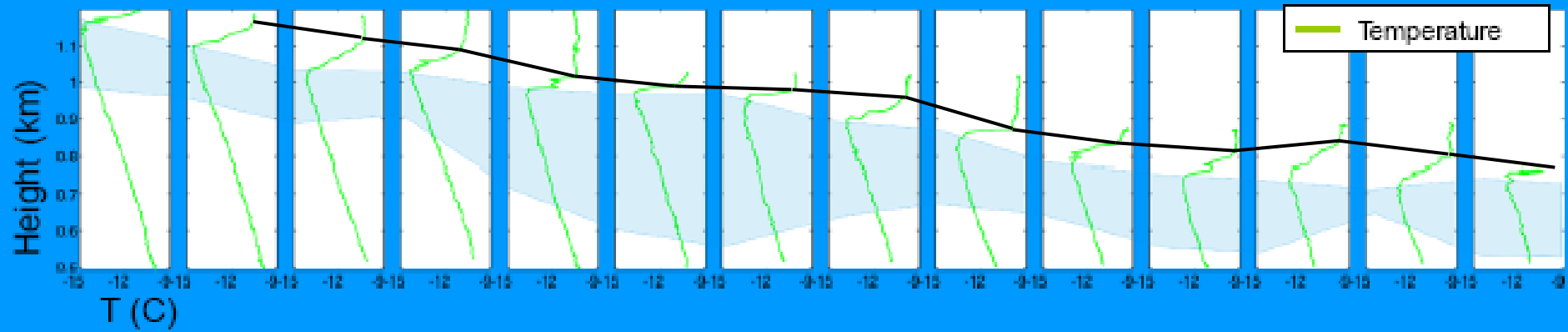
***Dendrites***

=> Best match for single layer case. Low ice nuclei concentrations required

***Hexagonal plates  
and Spheres***

=> Best match for multi-layered case.  
Require 25 times the ice nuclei concentration for dendrites.

# 08 April 2008, ISDAC flight #16, NRC Convair 580, Barrow, Alaska



Alexei Korolev (ISDAC April 8, 2008)

# ALTOS: Science Questions

- What is the distribution of microphysical properties of low-level Arctic clouds?
  - Ice crystal habits
  - Depend on environment?
- What is the horizontal variability in microphysical properties of low-level Arctic clouds?
  - Determining factors?
- Do gravity waves impact microphysical properties of low-level Arctic clouds?
  - Micro- & macroscopic properties
- Retrieval verification
  - Statistical distributions
- Ice shattering
  - Low aspiration balloon measurements
- Can routine measurements be accomplished in BC clouds?

# ALTOS: Measurements

- **Tether Balloon**

- Cloud Particle Imager/FSSP
- Ice Nuclei (filter)
- Cloud Condensation Nuclei
- Basic Met: T, Td, p, u, v

- **Surface Instrumentation**

- Full radiometer package
- MWR
- Surface Met
- (MMCR, MPL)

## Sampling Strategies

- BL Profiling
- Cloud Profiling
- Constant altitude



**Instrument Package Images Cloud Particles, Measures Pressure, Temperature, Dew Point, Winds, Ice Nuclei, Records GPS, Contains Onboard PC, Flash Disk and Telemetry**



Paul Lawson -SPEC-Inc



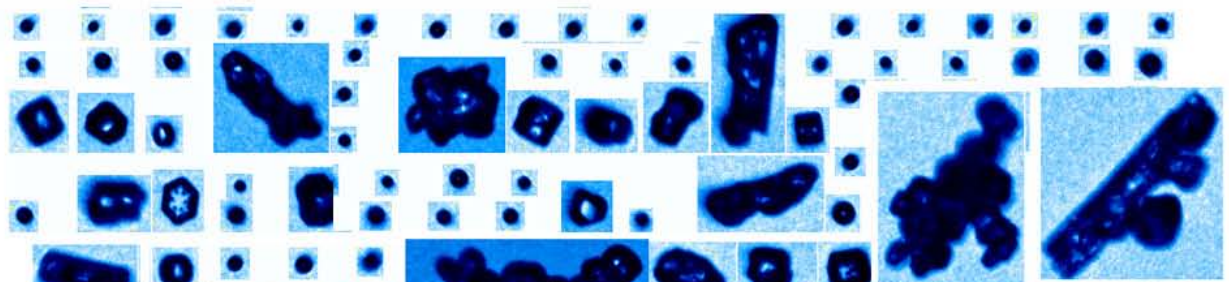
June 2, 2008

**T** Palt (ft.) **Warm Mixed-Phase Cloud with Large Ice at Cloud Base**

M  
i  
x  
e  
d  
  
A  
l  
l  
I  
c  
e

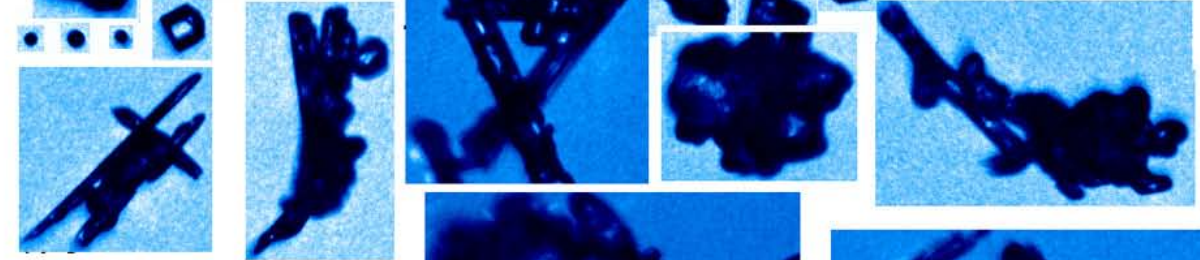
-2

2000



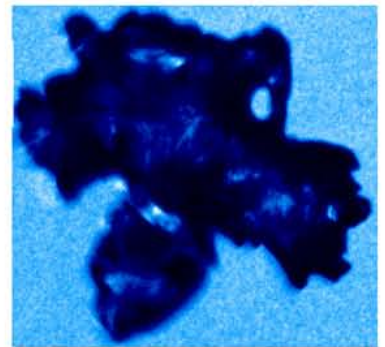
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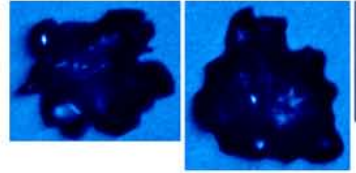


0°C

0 Ft



Cloud Base

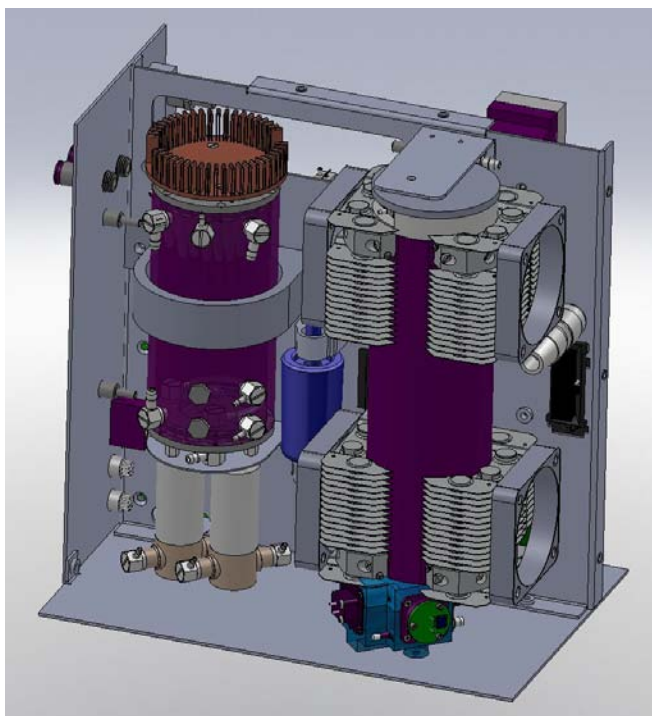


Surface

↔ 200 μm

# Mini-CCN instrument

Supersaturations	0.1 to 1% scan (5 min)
Flow rate	100 to 150 cm <sup>3</sup> min <sup>-1</sup>
Column length	130 mm



dimensions:  
20 cm x 20 cm x 10 cm

weight and power:  
1.5 kg & <25W

**Greg Roberts – Scripps**