



Controlled Meteorological Balloon Development for the Southeast Texas Balloon Study

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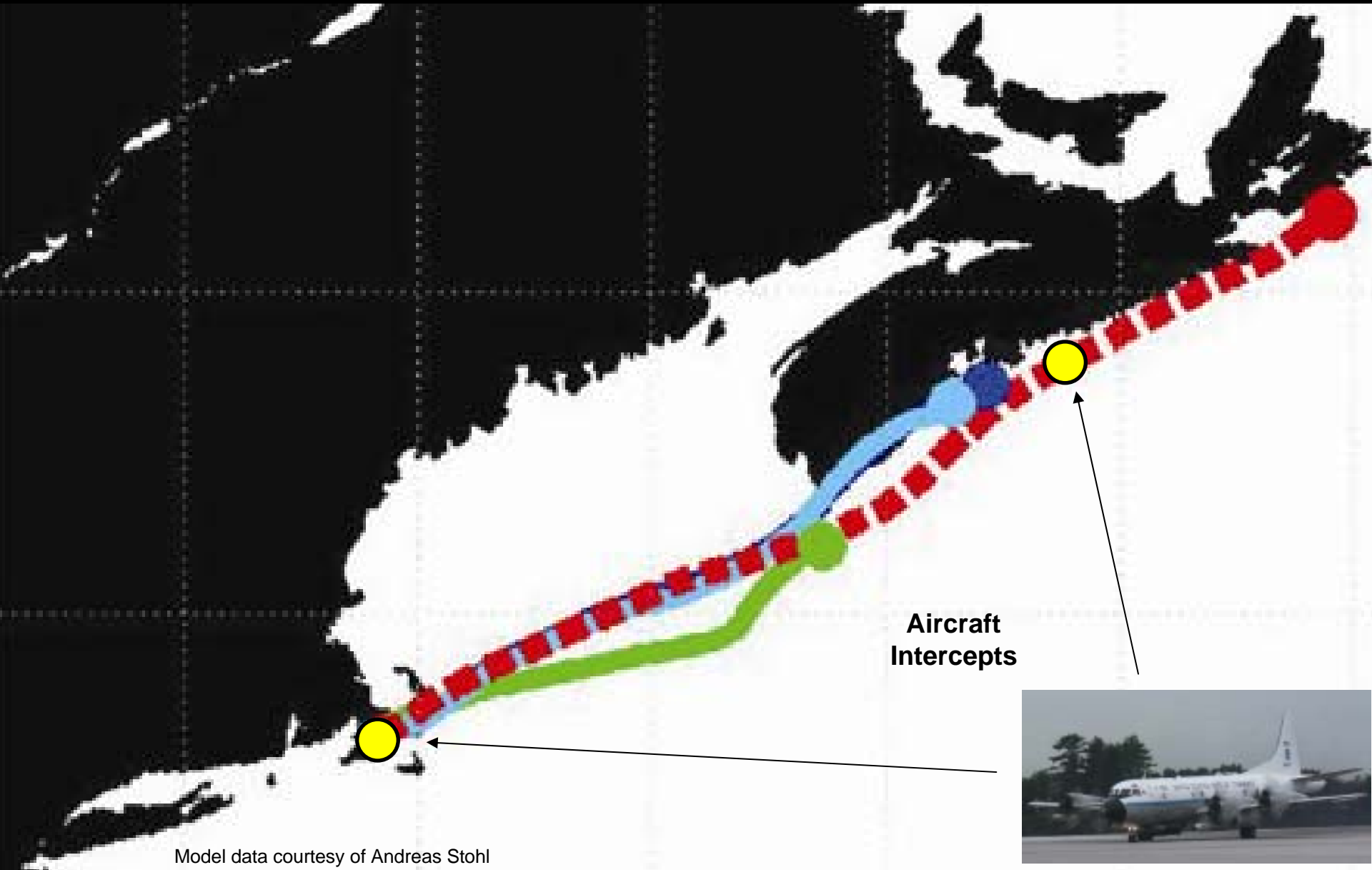
Carl Berkowitz and Rahul Zaveri
Battelle Northwest Laboratories

March 15, 2005



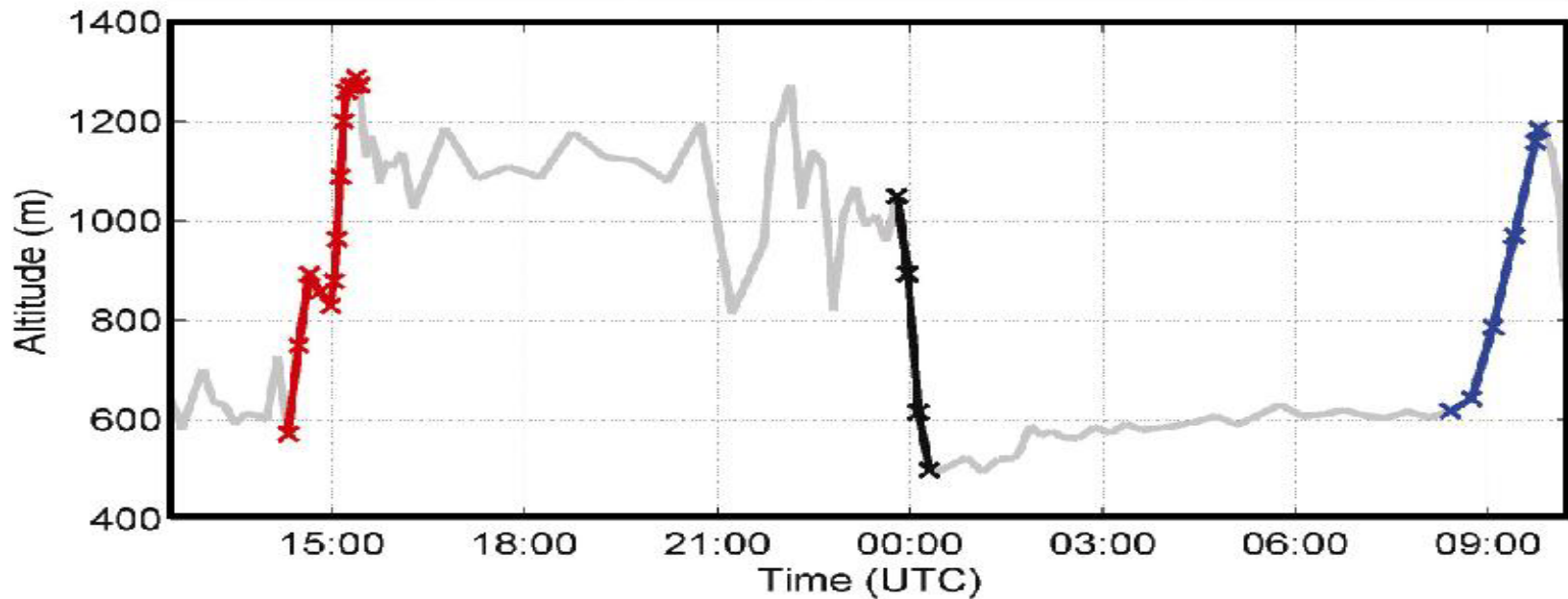
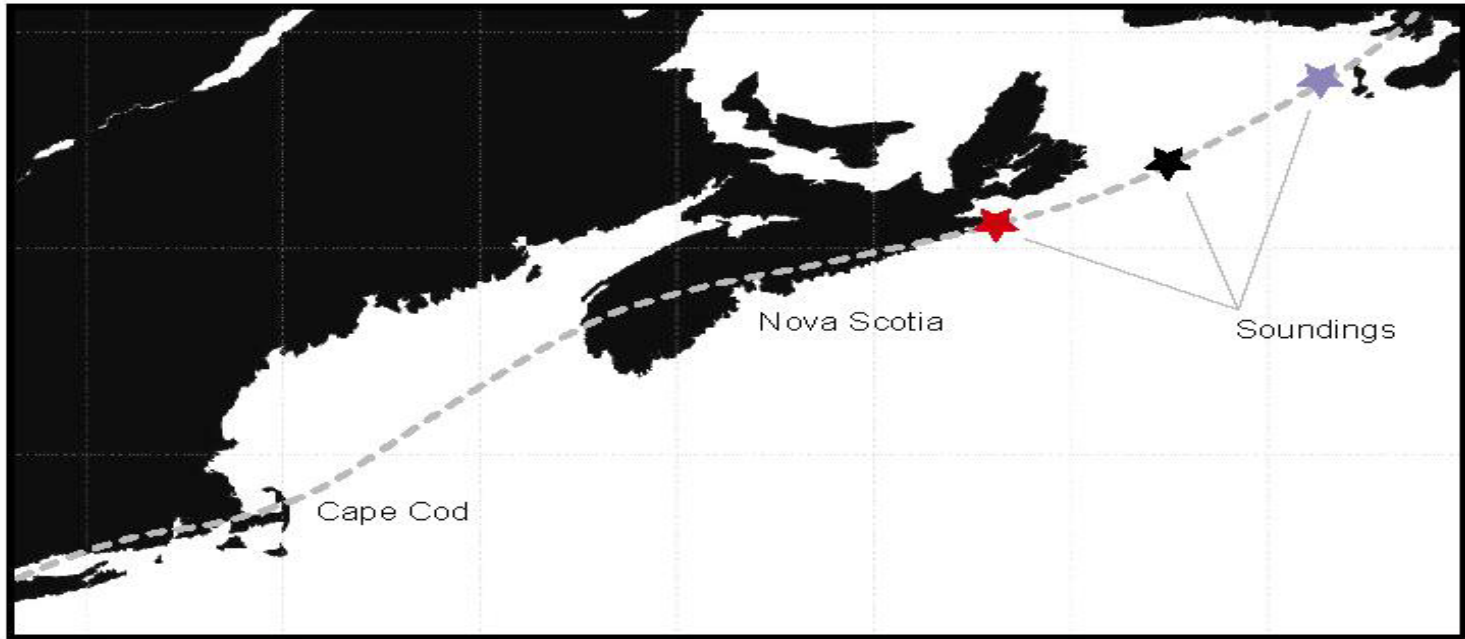
Observed and Modeled Trajectories at 500 m

ICARTT Campaign, July 20, 2004



Model data courtesy of Andreas Stohl

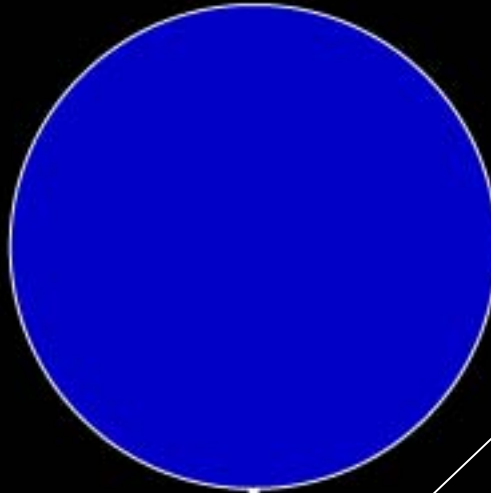
Balloon Soundings of Wind and Temperature



COMET Balloon Engineering Goals

Zero Pressure Balloon

- Eliminate conductive film
- Decrease solar heating
- Streamline aerodynamics



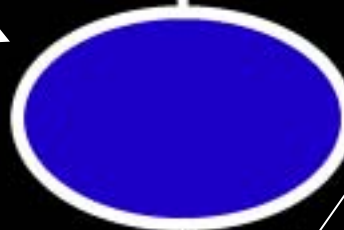
Helium Transfer System

- Simplify design



Superpressure Balloon

- Streamline assembly
- Increase maximum pressure



Payload

- Weatherproof enclosure
- Reduce power consumption



Software

- Improve control algorithm
- Develop sounding code

Met Sensor Package

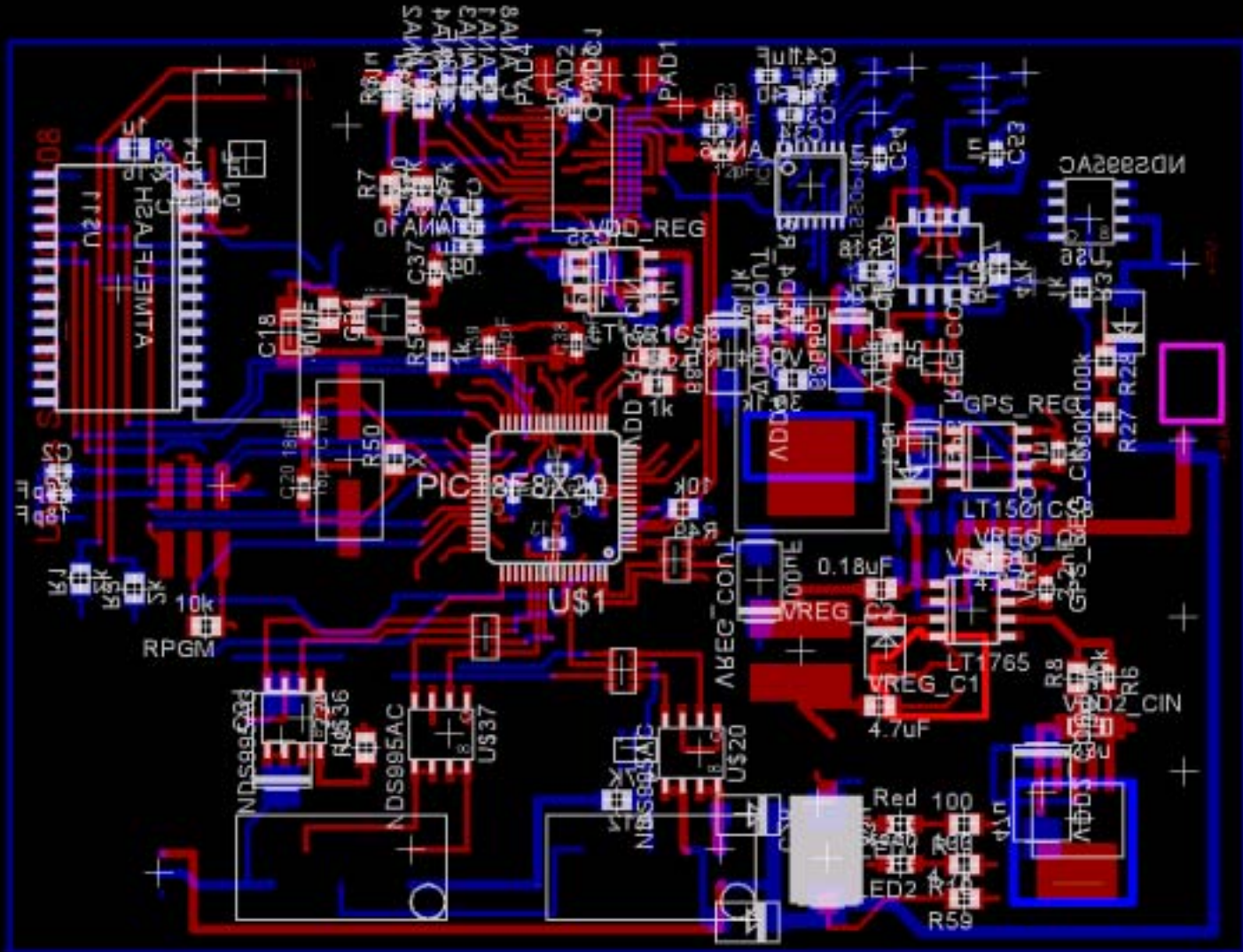
- Add RH sensor

Safety

- Improve terminator
- Add radar reflector
- Add strobe light

New Microcontroller Board

Pic 18X microcontroller, GPS, met and control sensors, pump and servo outputs, satellite modem interface, battery-photovoltaic management





Acknowledgements

Student Contributors

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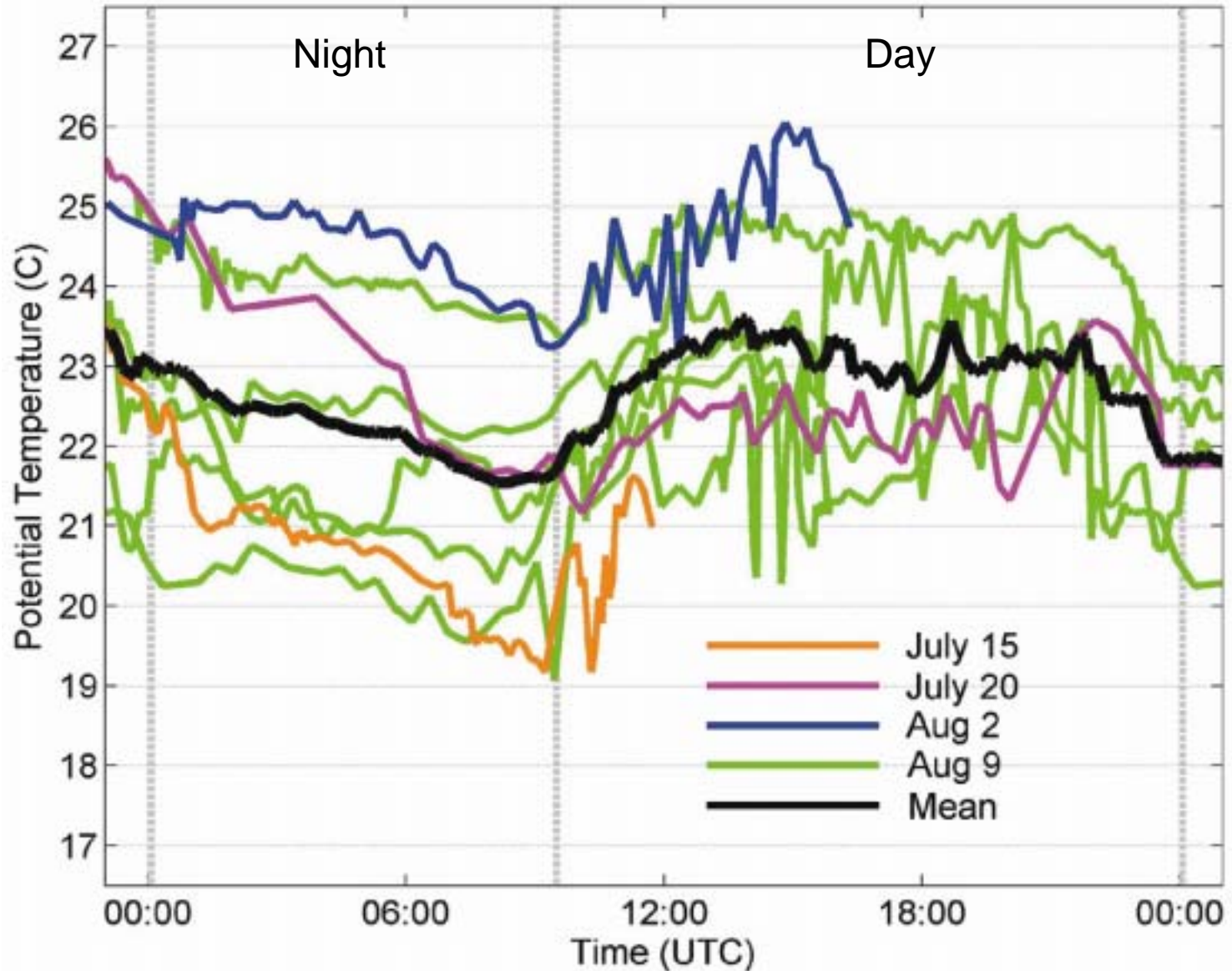
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NAL Research

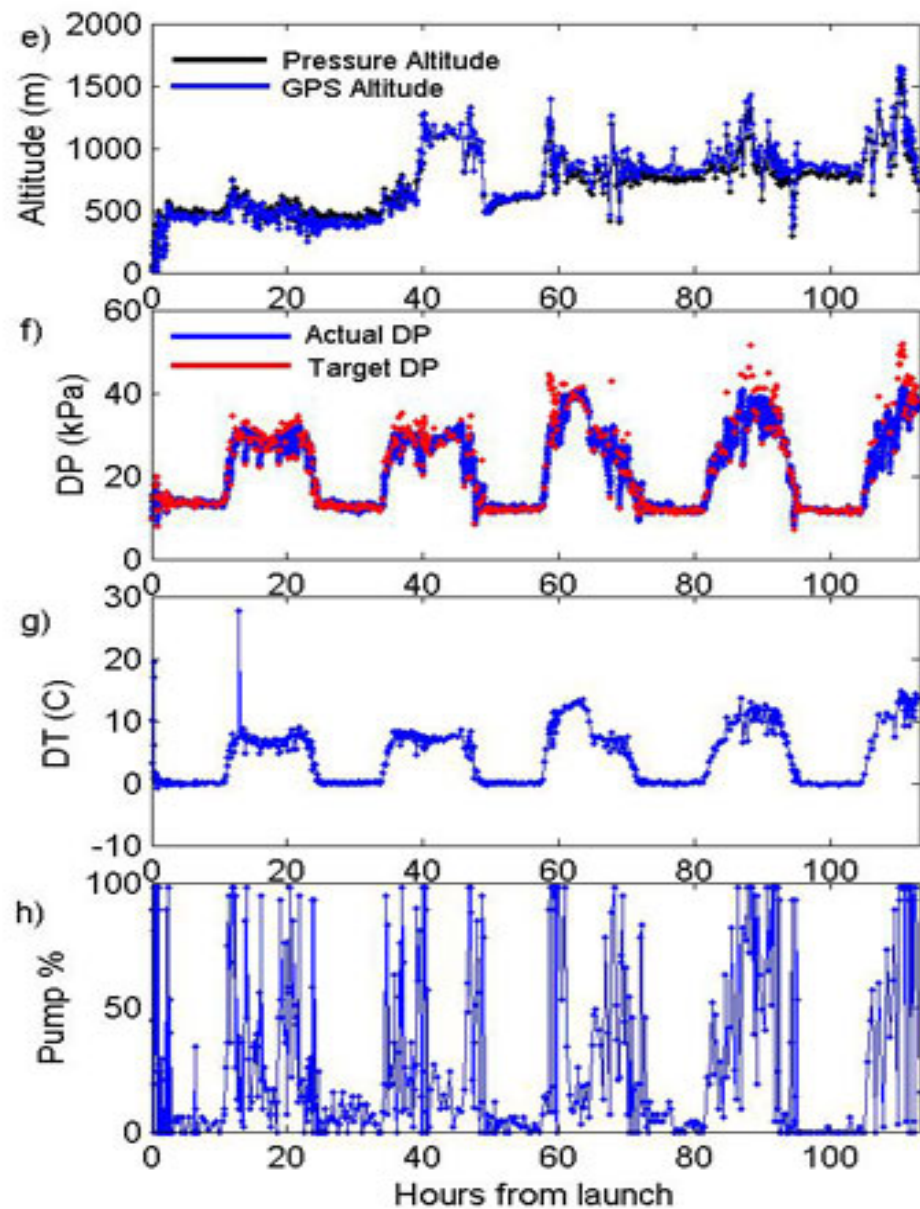
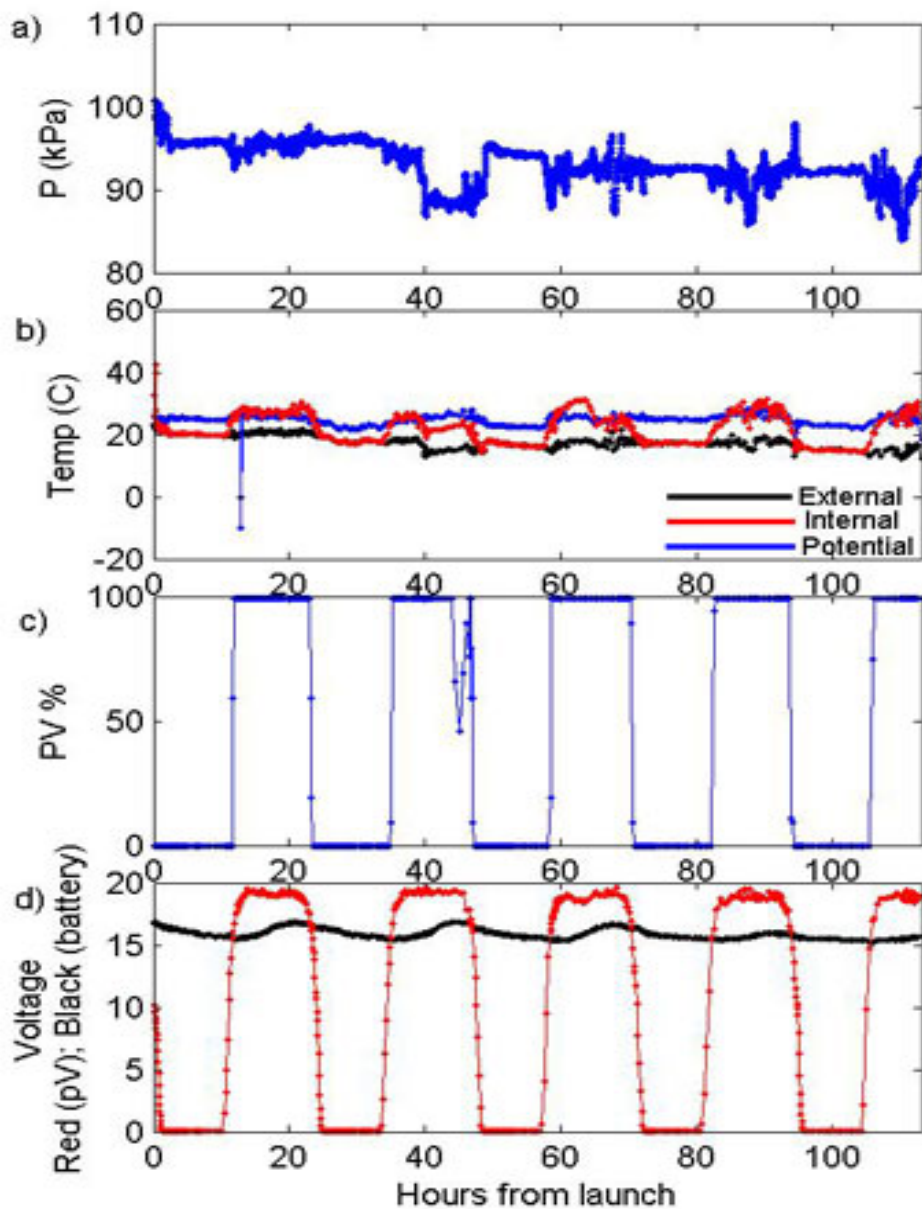
Impact of Air Pollution on Regional Climate

First direct measurements of radiative heating and cooling rates?



Real-Time Balloon Flight Data

August 9-14, 2004



Total column of species 1 for age class all
Simulation start 20040714.210000 Actual time 20040715.140000
Mean value 0.324E+01
Maximum value 0.794E+02
Minimum value 0.000E+00

