# The Sterling Field Support Center

**“Excellence in Field Support and Testing”**

An Overview of the SFSC

# Mission Statement

The Sterling Field Support Center is a one of a kind facility. Our mission is to ensure the  observing systems in part or in entirety produce scientifically sound data which conforms to National and International standards for Upper Air, Surface and Climatological reporting.

As the NWS experts in these systems, the SFSC provides timely response to operational field problems and concerns related to these systems. The SFSC is the apex for integration of new and modified observational equipment and procedures.


Approximately 200 acres
Four Buildings
32,000 square feet under roof
WFO
WSR88D
Radomes
Radomes
Inflation BLDG
Wind Tunnel
SFSC Test Beds
Bldg 16/
Observer
Tower
Old Ox Rd
Weather Service Road
©2012 Google
Google
Imagery Date: 8/28/2010
1991
38°58'23.82" N 77°29'08.57" W elev 279 ft
614
Eye alt

# Types of Upper Air Test Performed

**Upper Air**

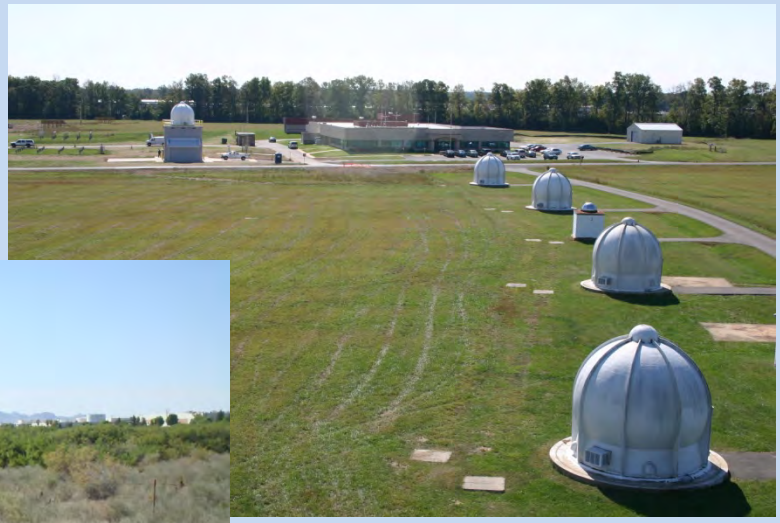
- Flight Similitude Tests
- System Repeatability
- Functional Precision
- Data Continuity  Studies
- Multi-Thermistor Test
- Snow White Relative Humidity Test
- Evaluating Solar Radiation Corrections
- GPS IPW comparison
- Field Test
- Other Chamber Tests
- Problem Isolation tests.

**SFSC Performs Calibration of:  Pressure, Temperature, Relative Humidity, and Wind Sensors - ISO16622**

# Upper Air Operations Center

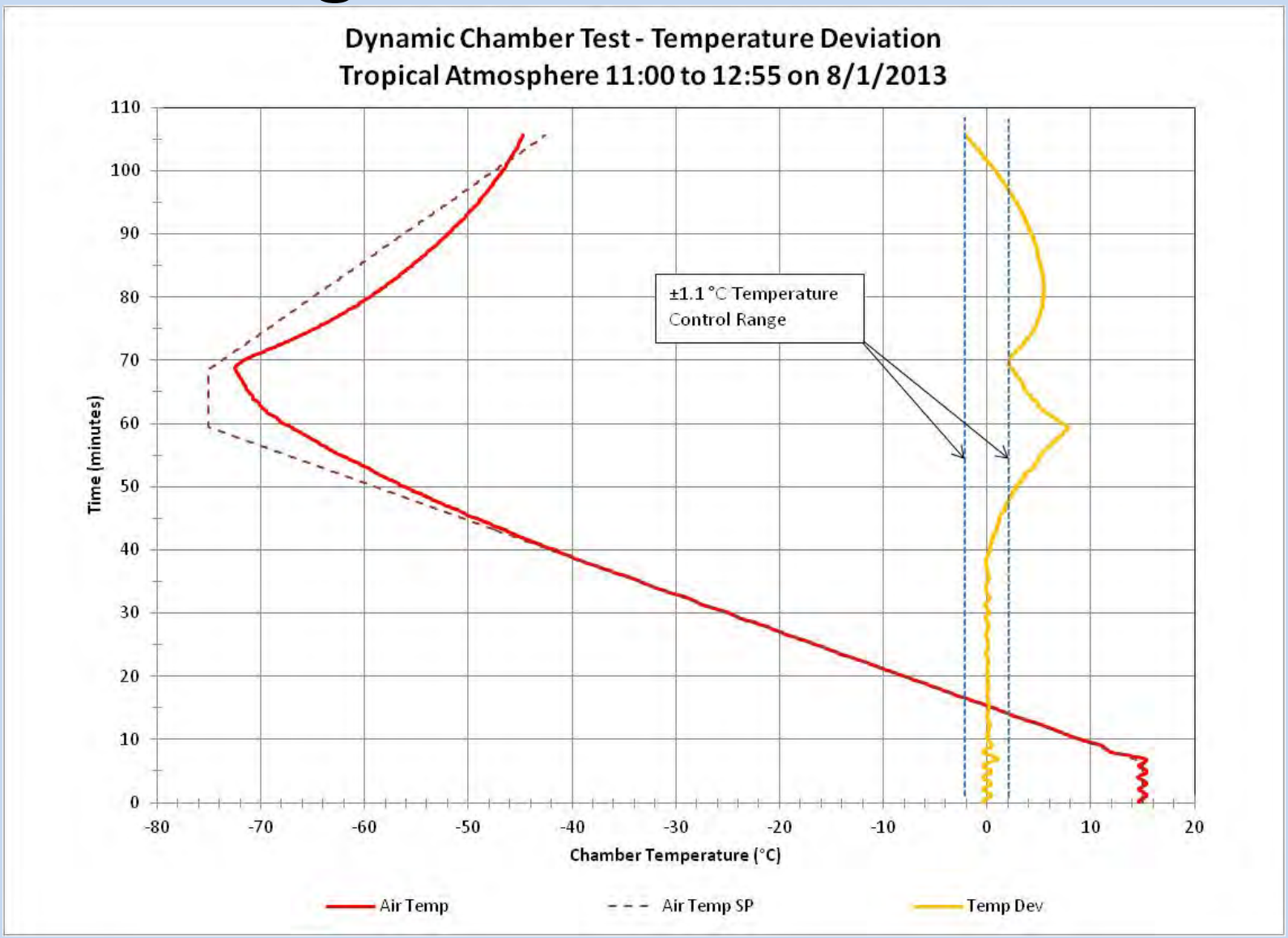
# Balloon Inflation Building with State of the Art Hydrogen Generator

# Upper Air Systems

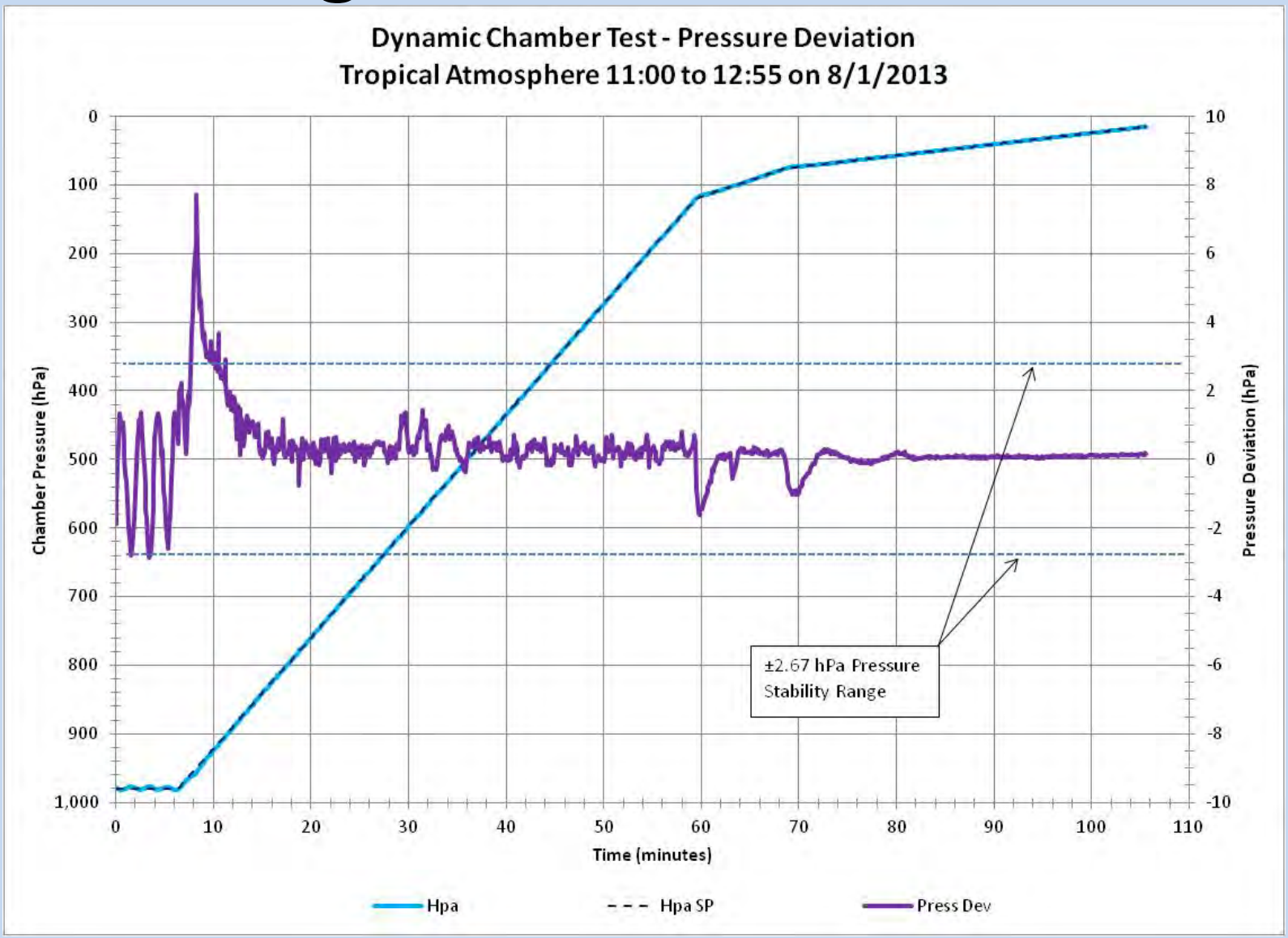



7 Upper Air Systems
Used and Maintained:
TRS – 4
MicroART – 2
1500 – 1
LMG6 – 2


# Flight Similitude Tests



# Flight Similitude Tests

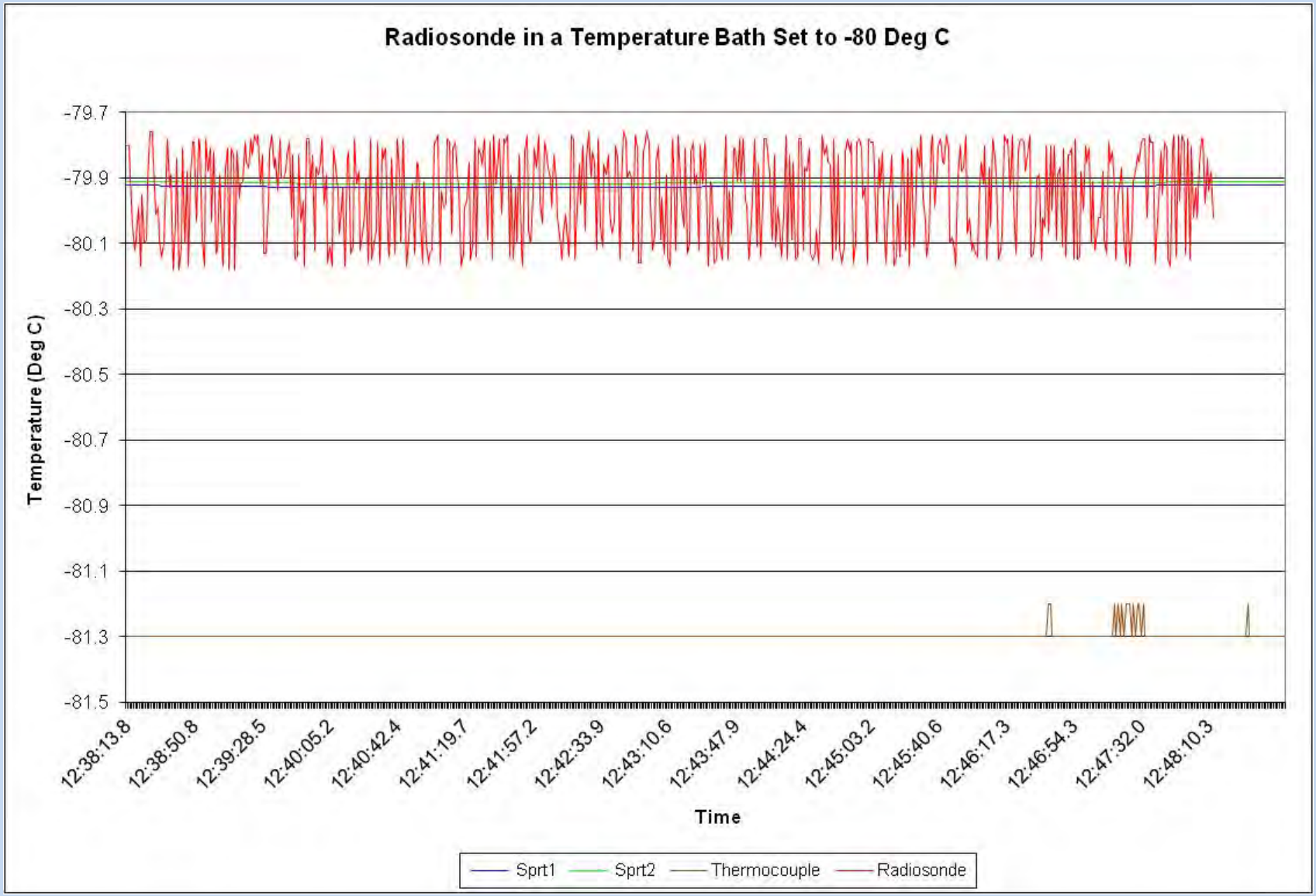


# Laboratory Resources

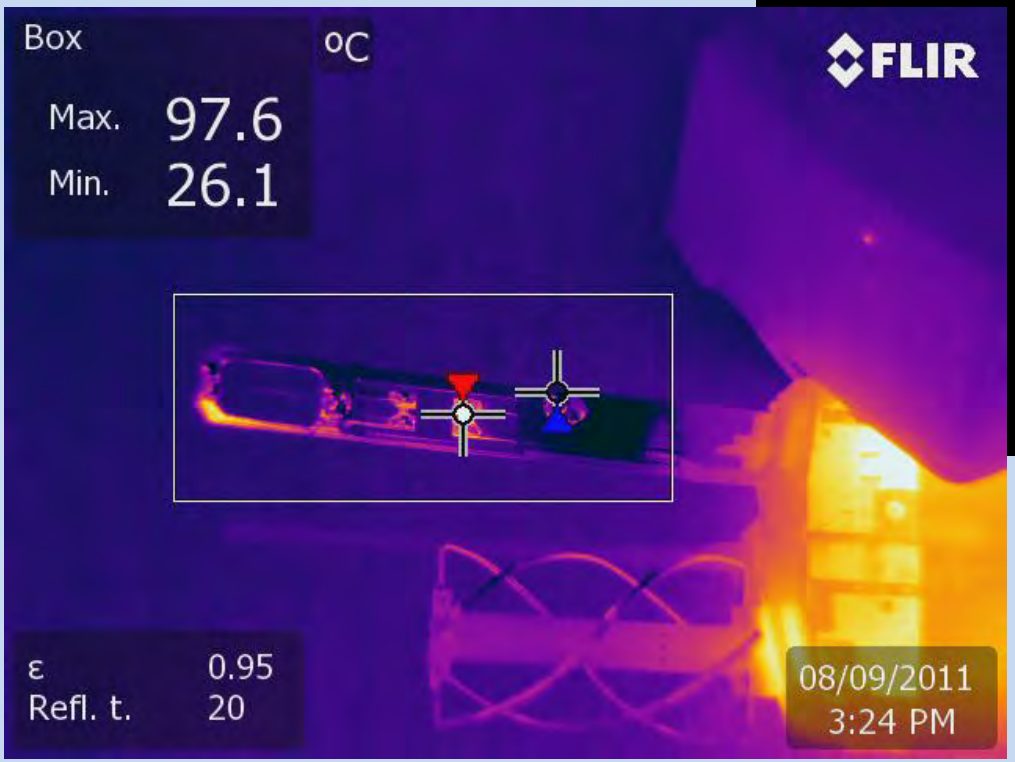
- 2 Walk-in Temperature/Humidity Chambers
- 1 Salt/Fog Chamber
- 1 Thermal Shock Chamber
- 1 Flight Similitude/Pressure Chamber
- 1 Temperature Bath
- 3 Temperature/Humidity Generators
- Pressure Lab
- 2 Wind Tunnels
- Vibration and Drop Stations
- Thermal Imaging Camera
- Microscopic Camera

# Available Chambers

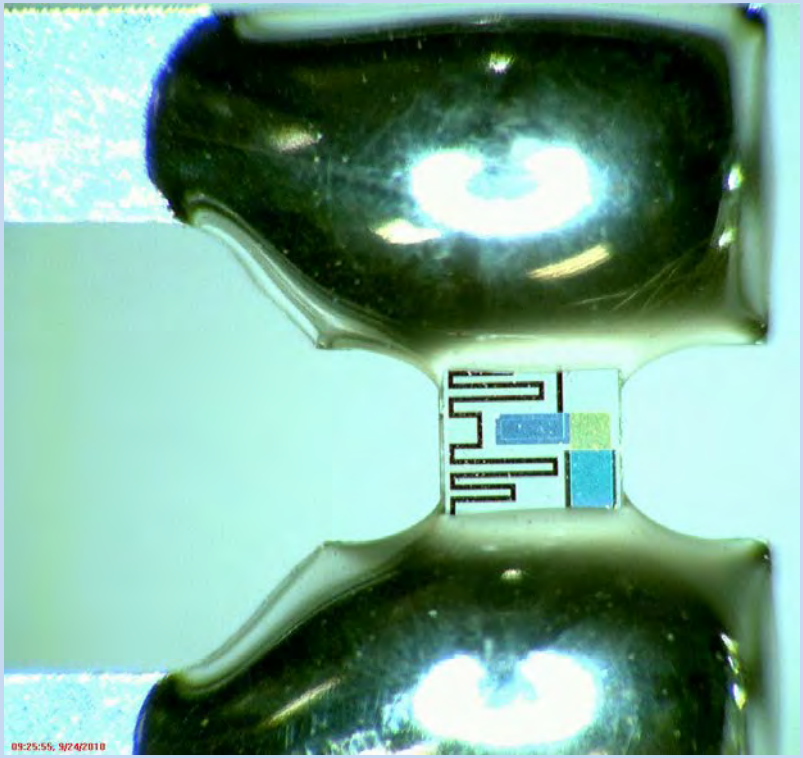

# Other Chamber Tests (Temperature Bath)

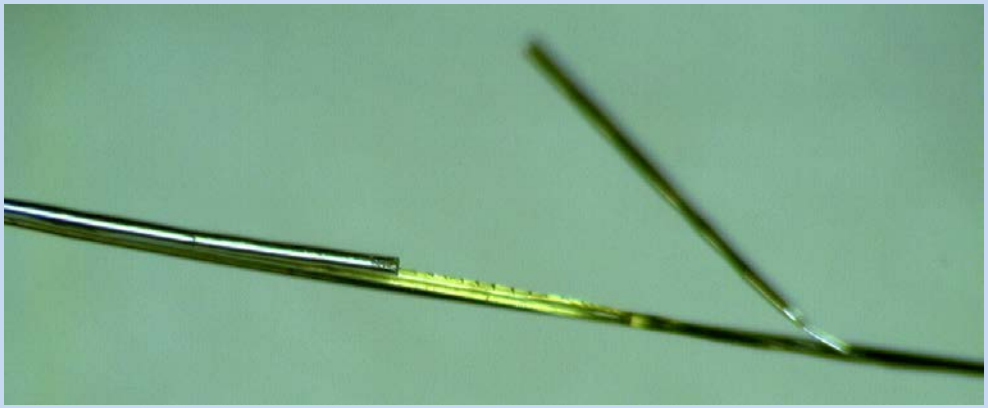


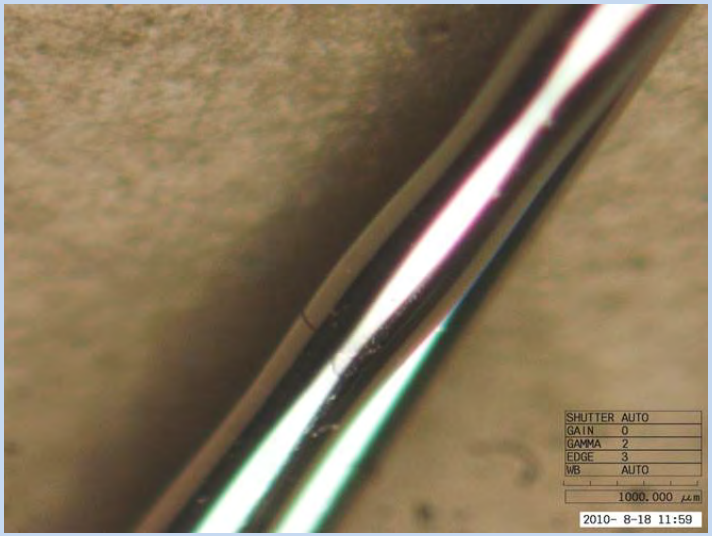
# Thermal Imaging



# Microscopic Imaging



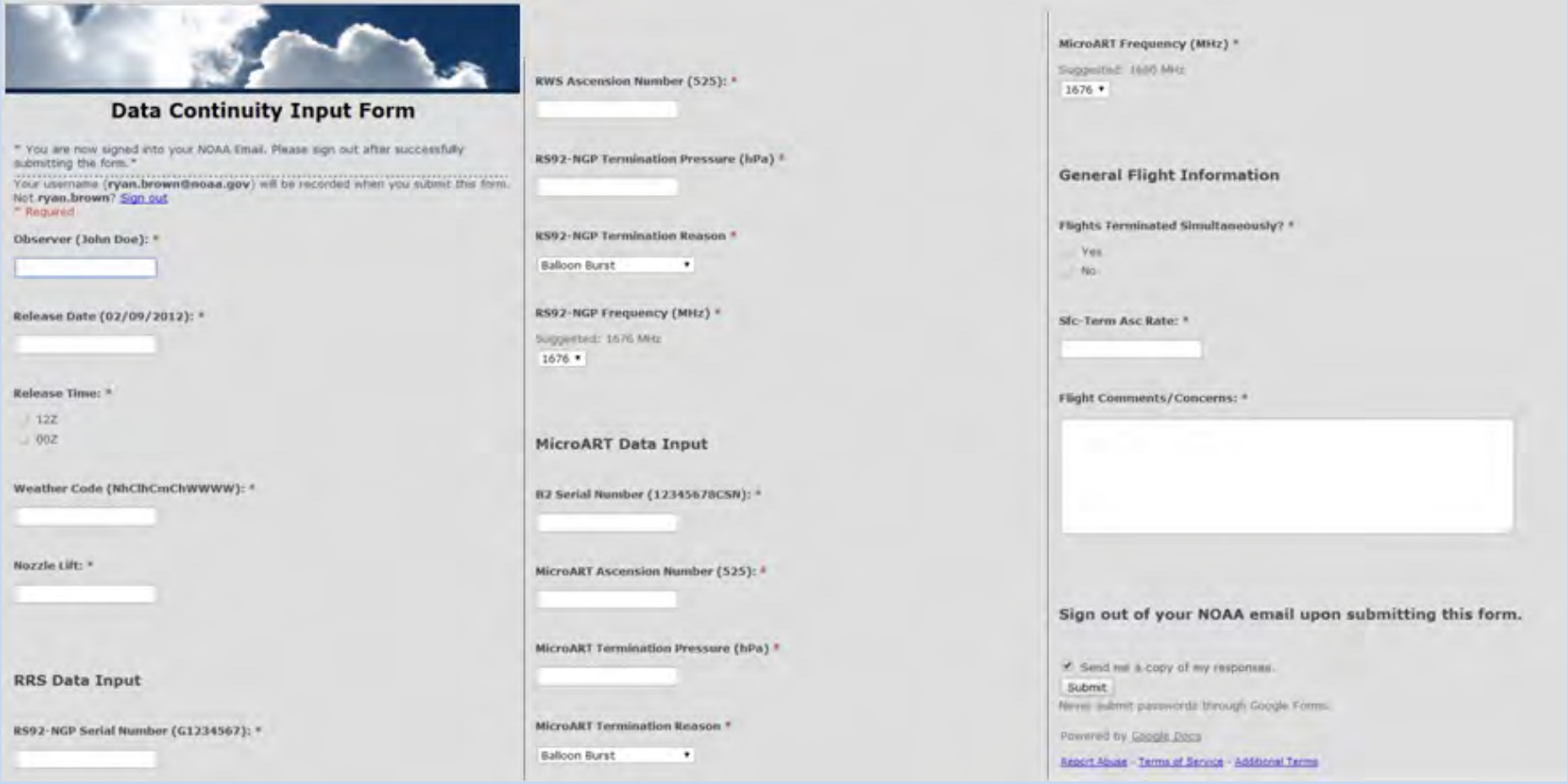


# Data Continuity Studies

Most recently coordinated MicroART vs. RRS Continuity Study

- Flights at 4 sites within the NWS network
- SFSC personnel traveled to each site upon startup
  - Completed a full site survey and Site Metadata form
  - Trained personnel on new RRS system (software, hardware, and radiosonde)
  - Trained personnel on releasing a dual bar
- All sites reported flight status back to SFSC via the DCS Flight Input Form
- Data analysis at NCDC and SFSC (high resolution Sterling data) is currently underway

# Data Continuity Studies



Data Continuity Input Form

* You are now signed into your NOAA Email. Please sign out after successfully submitting the form.*

Your username (ryan.brown@noaa.gov) will be recorded when you submit this form. Not ryan.brown? Sign out

* Required

Observer (John Doe): *

Release Date (02/09/2012): *

Release Time: *

12Z

00Z

Weather Code (NhClhCmChWWWW): *

Nozzle Lift: *

RRS Data Input

RS92-NGP Serial Number (G1234567): *

RWS Ascension Number (525): *

RS92-NGP Termination Pressure (hPa) *

RS92-NGP Termination Reason *

Balloon Burst

RS92-NGP Frequency (MHz) *

Suggested: 1676 MHz

1676

MicroART Data Input

B2 Serial Number (12345678CSN): *

MicroART Ascension Number (525): *

MicroART Termination Pressure (hPa) *

MicroART Termination Reason *

Balloon Burst

MicroART Frequency (MHz) *

Suggested: 1680 MHz

1676

General Flight Information

Flights Terminated Simultaneously? *

Yes

No

Sfc-Term Asc Rate: *

Flight Comments/Concerns: *

Sign out of your NOAA email upon submitting this form.

Send me a copy of my responses.

Submit

Never submit passwords through Google Forms.

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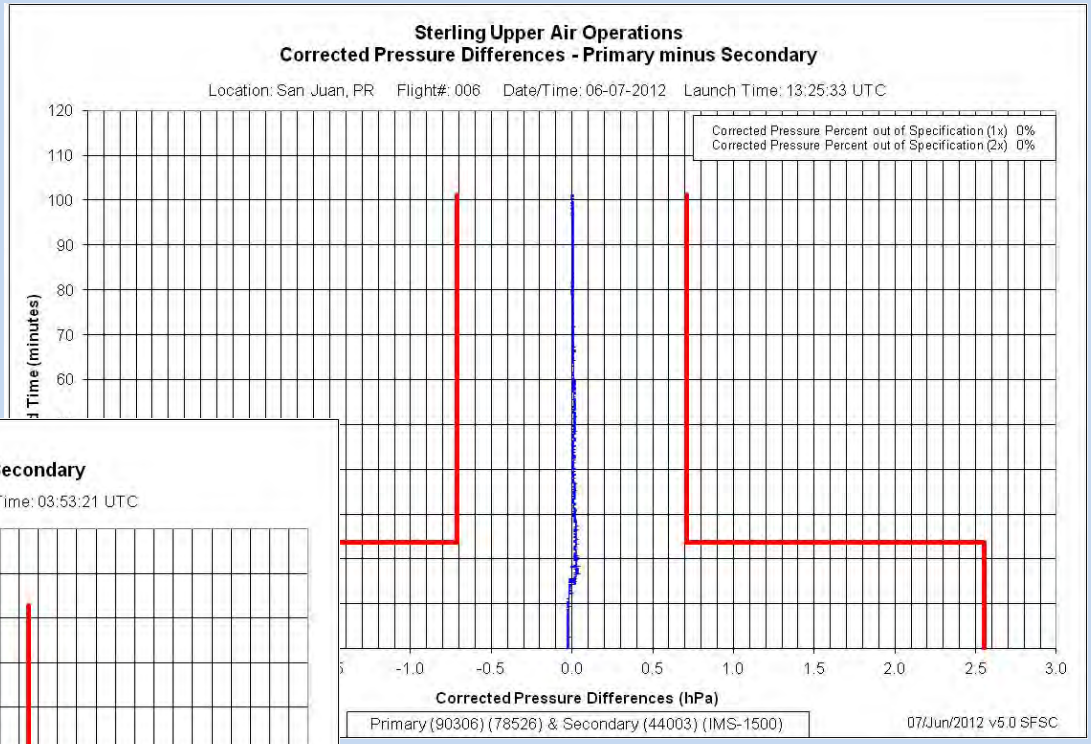
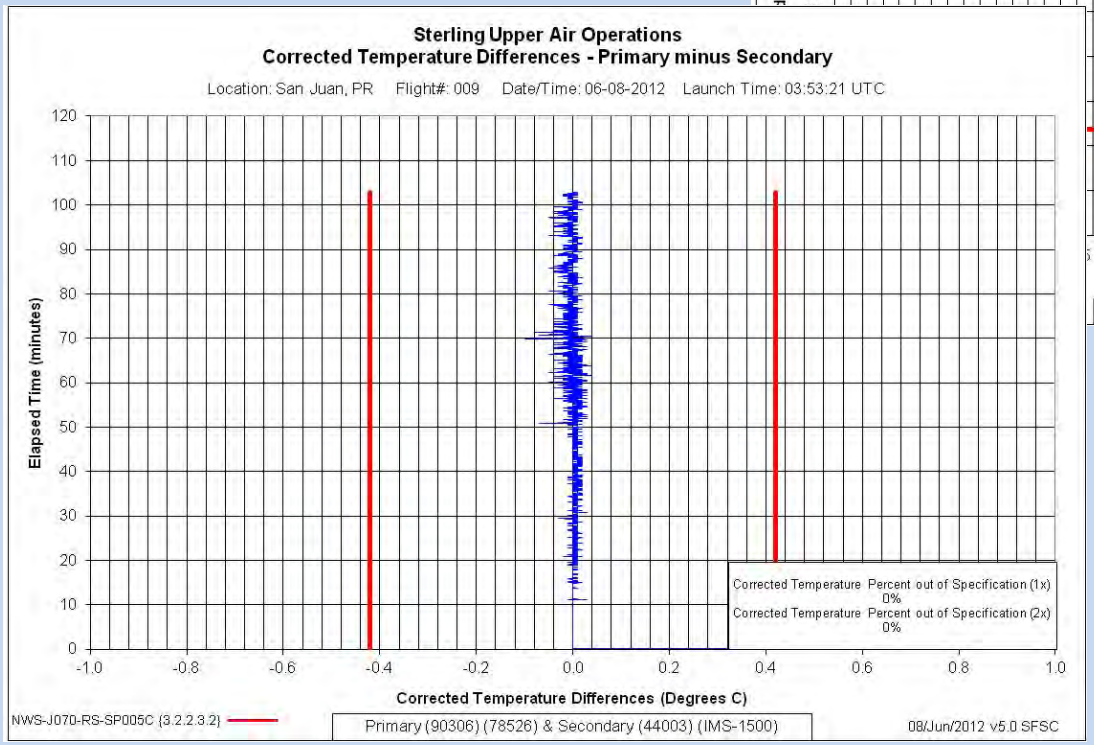
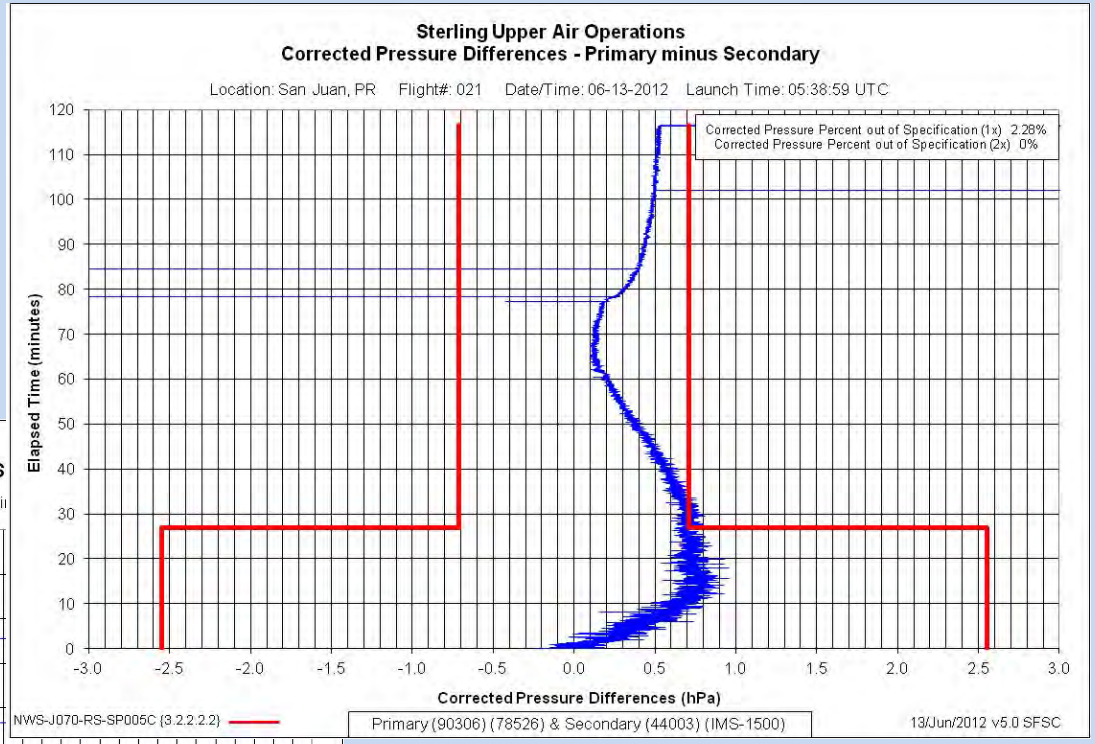
Report Abuse - Terms of Service - Additional Terms

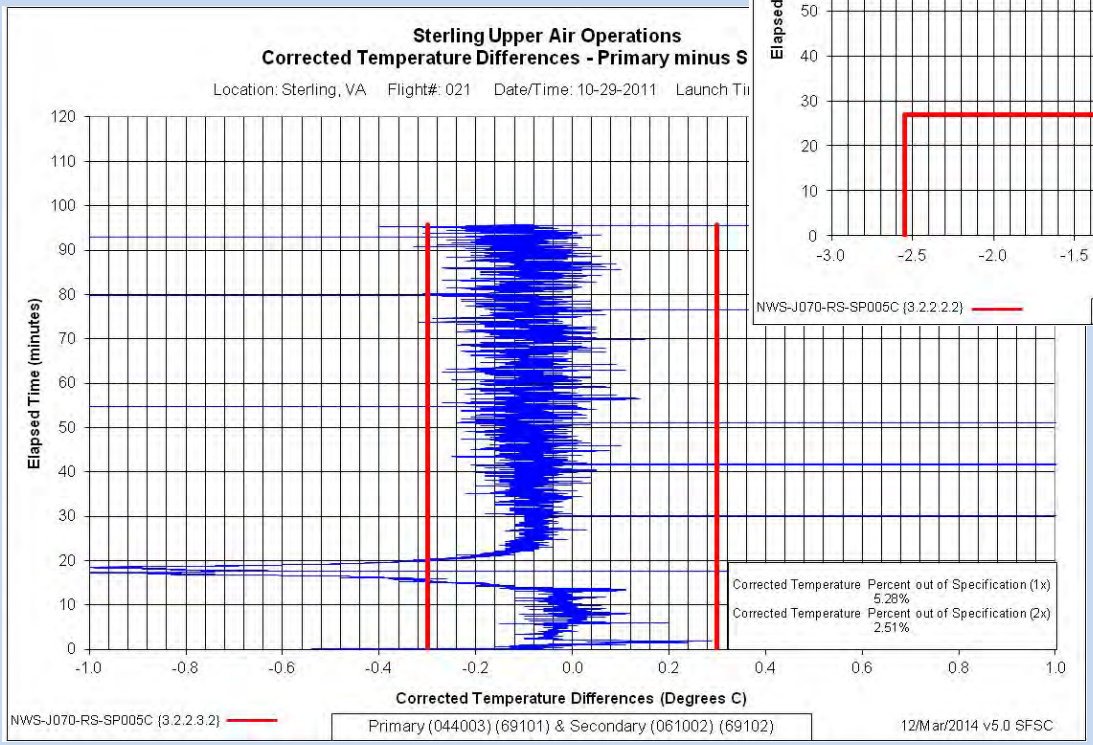
# System Repeatability



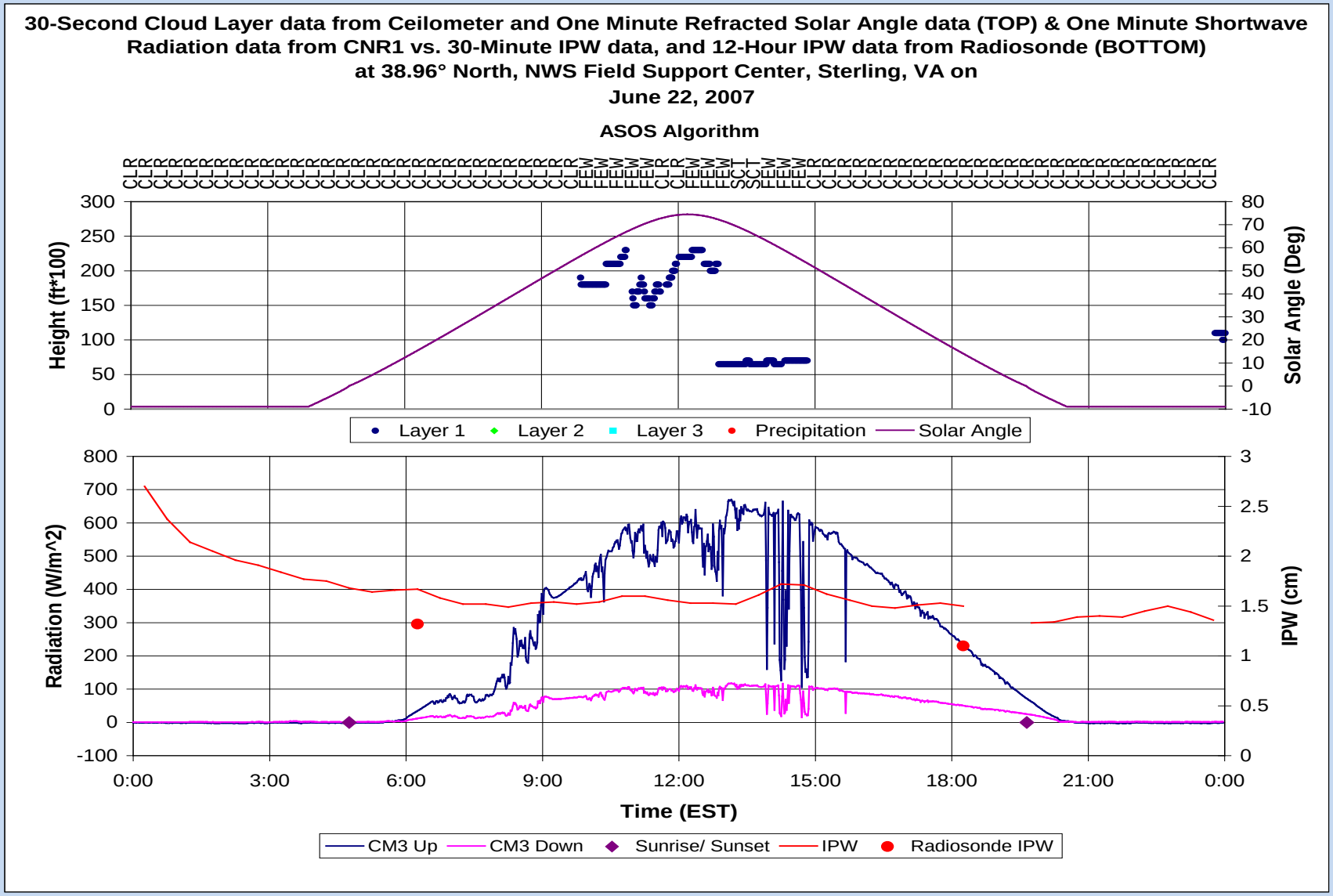



# Functional Precision

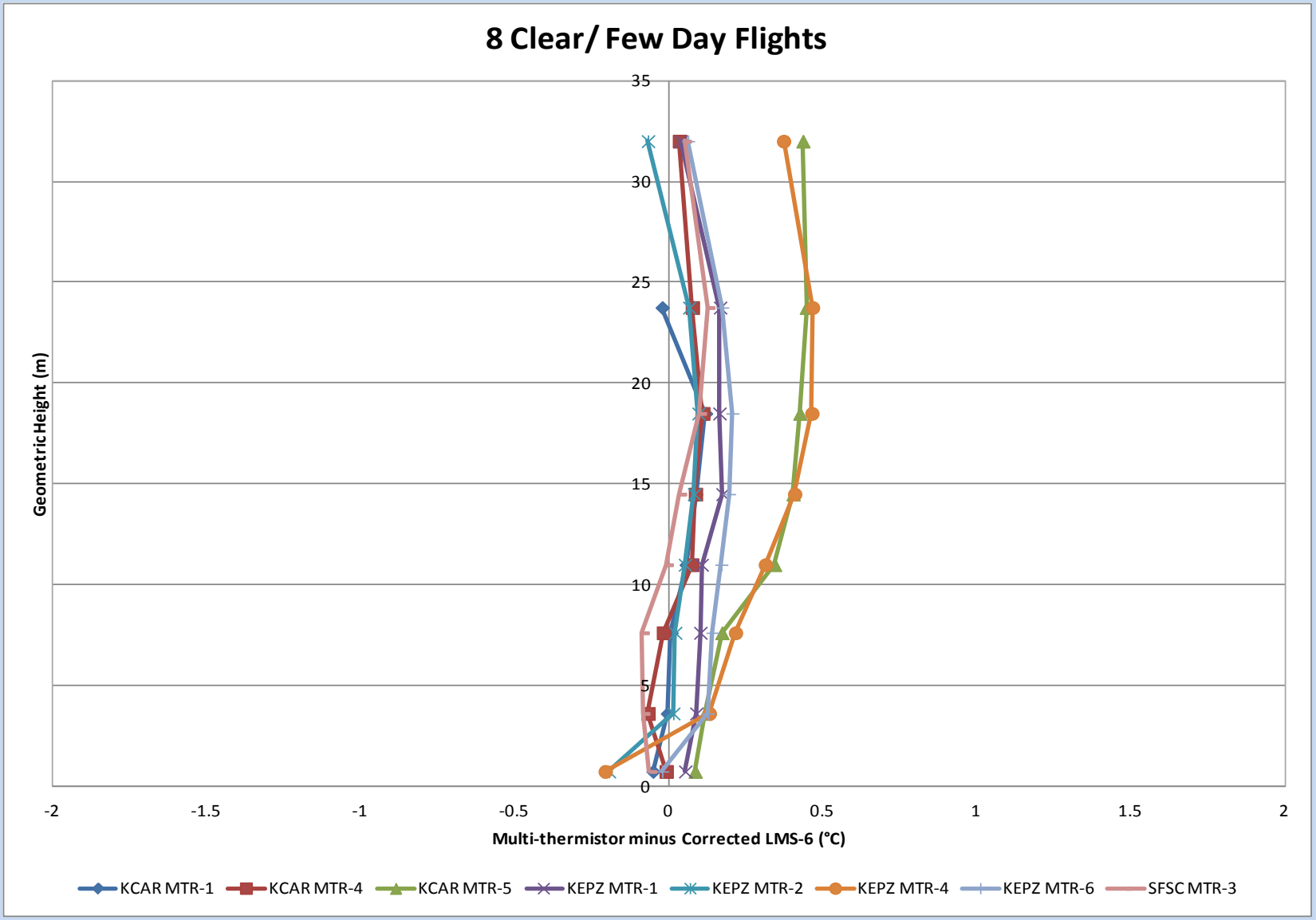


# Evaluating Solar Radiation Corrections



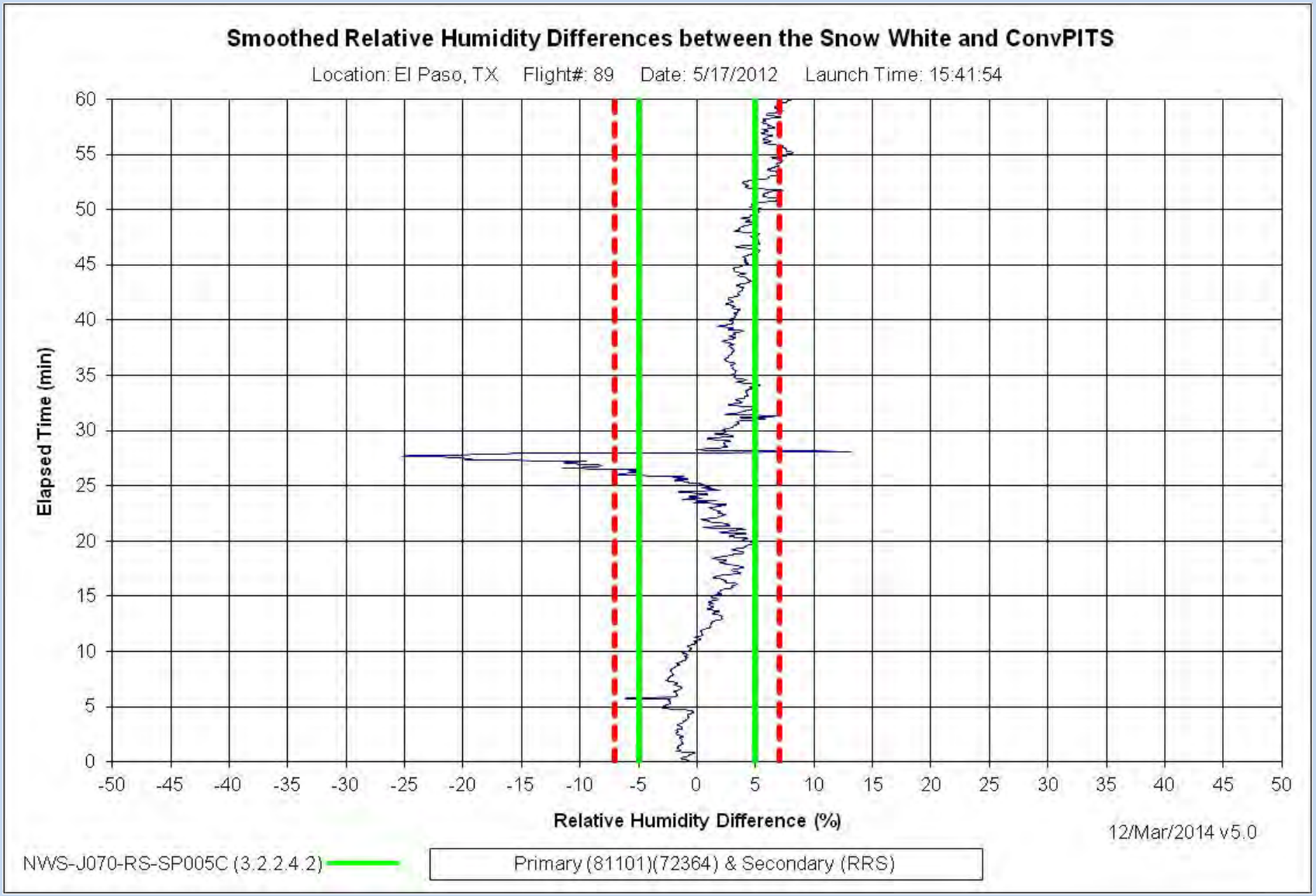
# Multi-Thermistor Tests



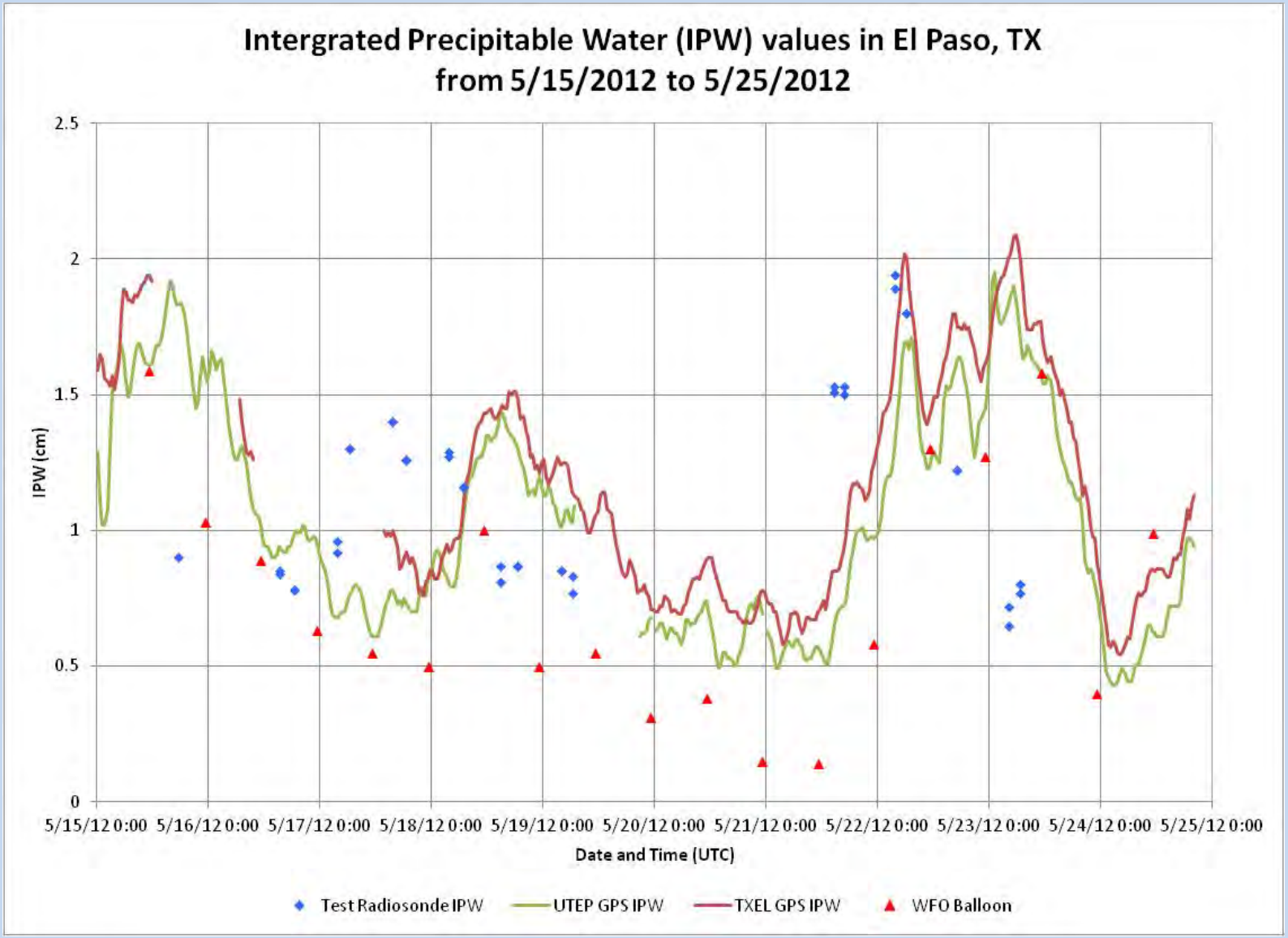
# Multi-Thermistor Tests

| Pressure (hPa) | Geom-Ht (km) | Count | Mean | STD | ATM RMS | RS RMS | 98.5% Envelope | Pcnt in Envelope |
|---|---|---|---|---|---|---|---|---|
| 20 - 4 | 27 - 37 | 5378 | 0.126 | 0.223 | 0.154 | 0.271 | 0.676 | 98.9 |
| 50 - 20 | 20.5 - 27 | 7053 | 0.207 | 0.214 | 0.143 | 0.257 | 0.650 | 97.3 |
| 100 - 50 | 16.5 - 20.5 | 5506 | 0.221 | 0.296 | 0.138 | 0.327 | 0.639 | 95.2 |
| 200 - 100 | 12.5 - 16.5 | 7115 | 0.189 | 0.207 | 0.109 | 0.234 | 0.566 | 96.9 |
| 300 - 200 | 9.5 - 12.5 | 4348 | 0.124 | 0.204 | 0.092 | 0.223 | 0.526 | 96.1 |
| 500 - 300 | 5.75 - 9.5 | 5355 | 0.065 | 0.123 | 0.075 | 0.144 | 0.483 | 99.7 |
| 850 - 500 | 1.5 - 5.75 | 6687 | 0.040 | 0.125 | 0.052 | 0.136 | 0.428 | 99.0 |
| 1070 - 850 | 0 - 1.5 | 1283 | -0.024 | 0.264 | 0.041 | 0.267 | 0.401 | 90.6 |
| ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== | ===== |
| 400 - 4 | 7.5 - 37 | 32326 | 0.170 | 0.228 | 0.124 | 0.259 | 0.603 | 96.8 |
| Sfc - 400 | 0 - 7.5 | 10404 | 0.033 | 0.148 | 0.055 | 0.158 | 0.434 | 98.3 |
| All | 0 - 37 | 42731 | 0.136 | 0.219 | 0.107 | 0.244 | 0.562 | 96.5 |

# Snow White/ Relative Humidity Tests



# GPS IPW Comparisons



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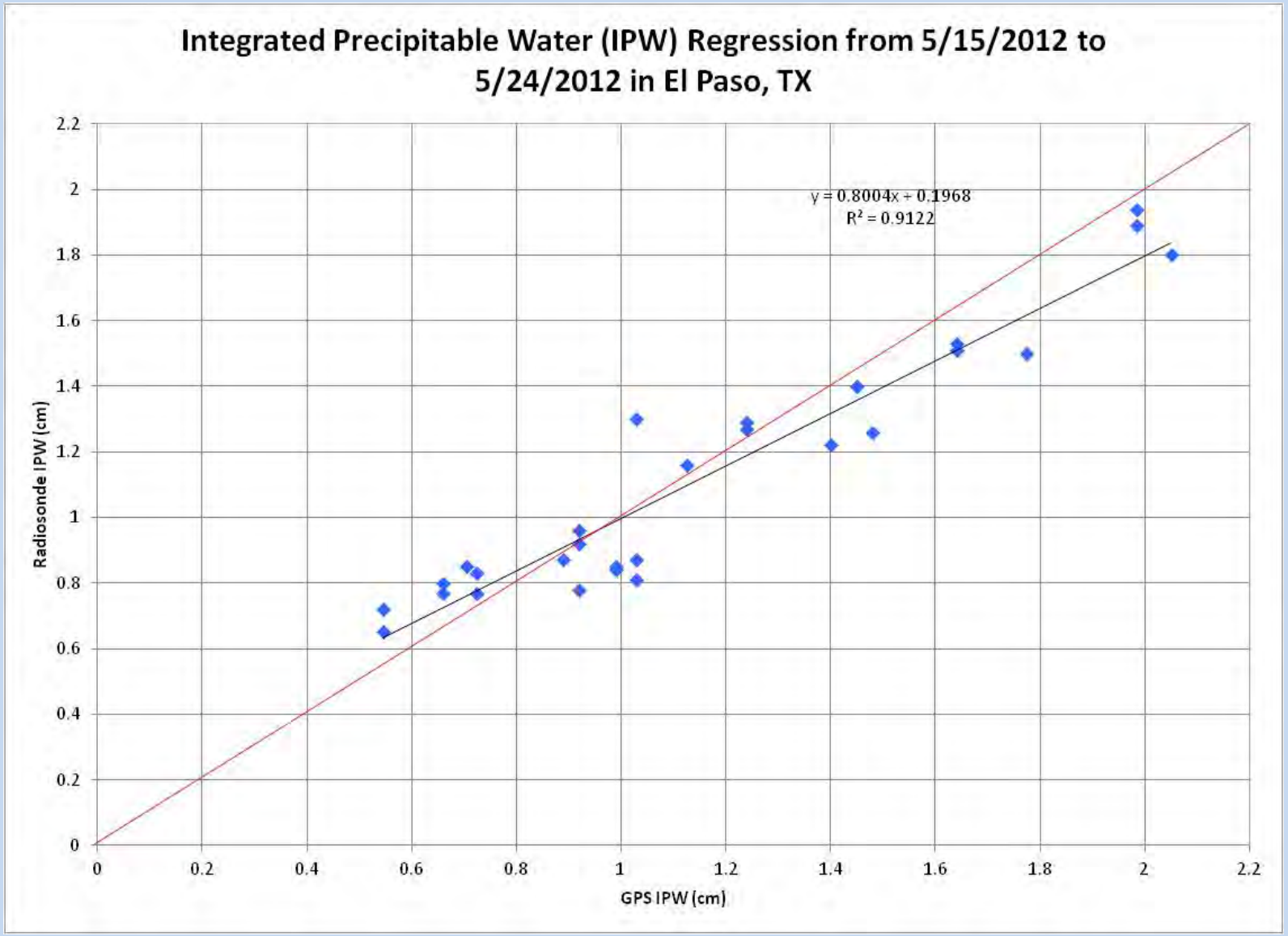


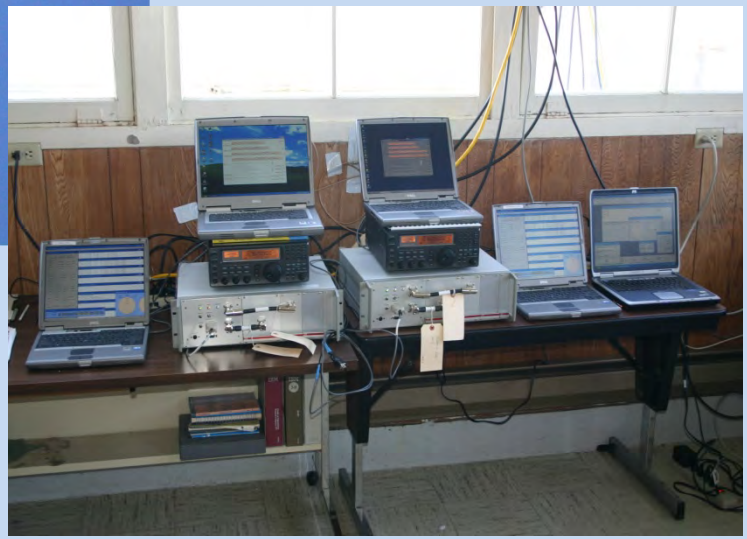
# Sites Frequently used for Testing

- SFSC has the capability to deploy to remote sites for testing or augmentation for field support.
- Sites frequently used in Upper Air tests:
  - Beltsville, MD
  - San Juan, Puerto Rico
  - Caribou, ME
  - El Paso, TX
  - San Diego, CA
  - Quillayute, WA

- SFSC is not limited to testing in these location

# Field Sites



# GPS Surveying

- GPS survey all upper air equipment at individual sites for accurate Metadata files
- Utilizes between 3-4 hours of continuous GPS triangulation data (Trimble 5700 GPS Receiver)
- Accuracy of data within 10cm
- Upload data to OPUS (Online Positioning User Service hosted by the National Geodetic Survey website) for processing (website provides processed data within 24 hours)
- Data is processed and utilized in all upper air equipment configurations
- This allows for (among other things) more accurate radiosonde positioning at the surface (lat, lon, height)

# Problem Isolation Tests

CHUAS

Field support

Going to sites to assist in fixes

Having systems sent to SFSC for troubleshooting

# Off-Site Capabilities and Services

- Support new system installation, system upgrades, and repairs.
  - Wallops Island, VA
  - Kodiak, AK
  - San Juan, PR
- Perform on-site training associated with new systems.

# *Other Services Provided*

## Maintains operational systems for:

- Development of procedures and handbooks
- Evaluation of  equipment modifications
- Evaluation of software modifications
- Evaluation of new technologies
- Consultation services to NWS management and other government agencies.
- Deployment of new systems to operations