

RICO NCAR Dropsonde and Radiosonde Data

Junhong (June) Wang
Kate Young
NCAR/EOL

1. Dropsonde data

- Overview
- Data QC and analysis

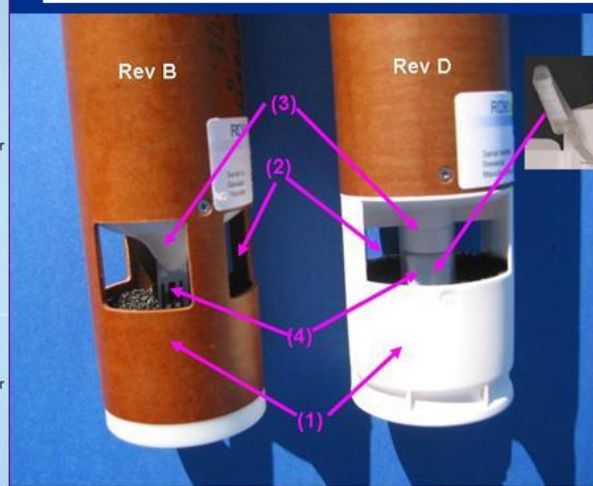
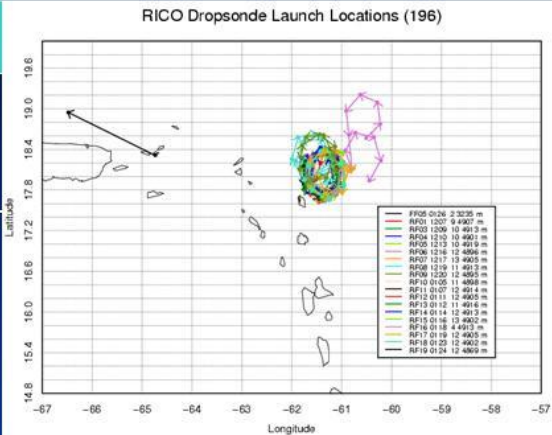
2. Radiosonde data

- Overview
- Highlights
- Data post-processing
- Data format
- Important notes

Acknowledgement: Dean Lauritsen, Terry Hock, Ned Chamberlain, and Tim Lim and all operators

Dropsonde Data from C-130

- Total 211 with 11 not-launched sondes and 4 sondes with caps on.
- Total 196 good soundings (18 flights) from ~5 km
- CLASS (text) format with 0.5 second sampling rate
- Released on May 1



Data quality control and analysis

1. ASPEN

2. Histograms of PTU and wind

★ 3. Time series of PTU and wind

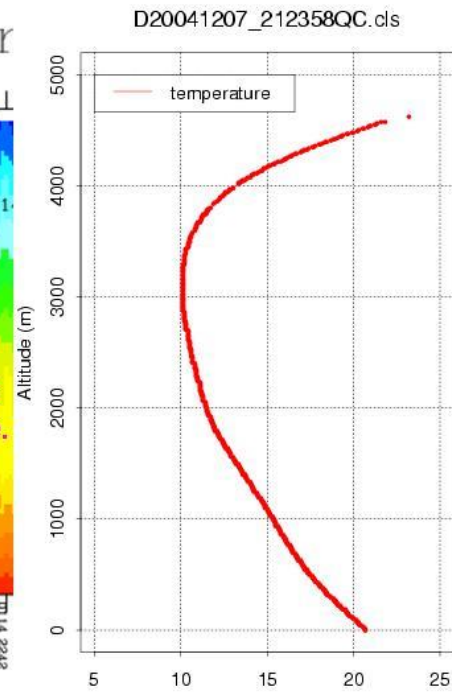
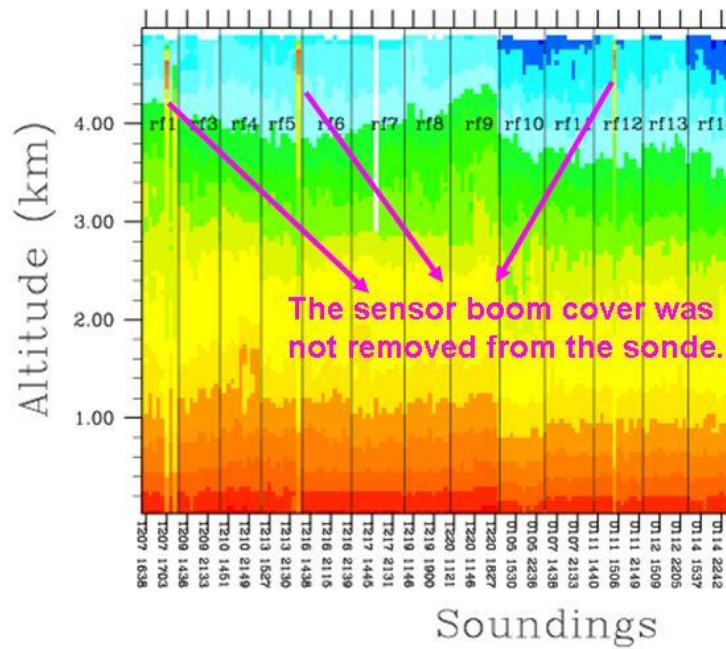
4. Individual Skew-T examination

5. Comparisons with other data

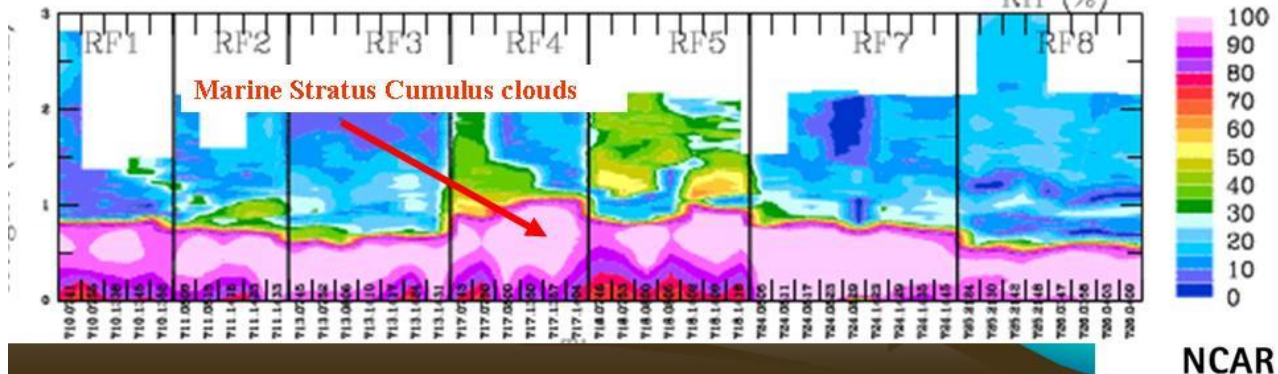
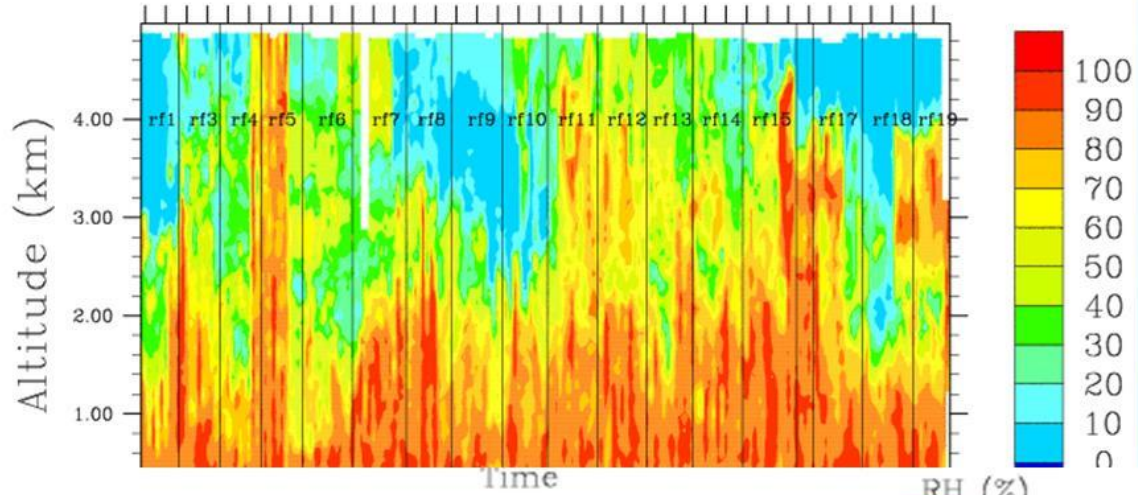


NCAR

RICO 2004-2005 Temper

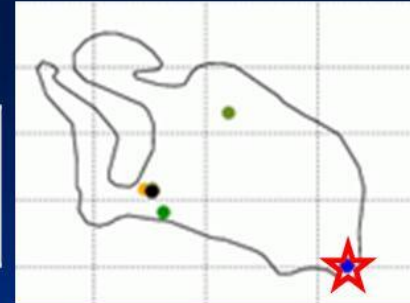


RICO 2004–2005 RH (%)



RICO GAUS Data

Total	Not-launched	Loss-of-signal	Recovered	Good-Up	Good-Down
170	23	20	15	144	92



GLASS:

Vaisala RS80-H



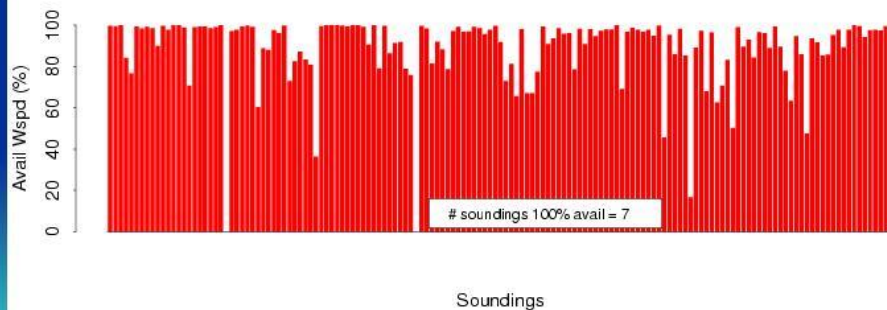
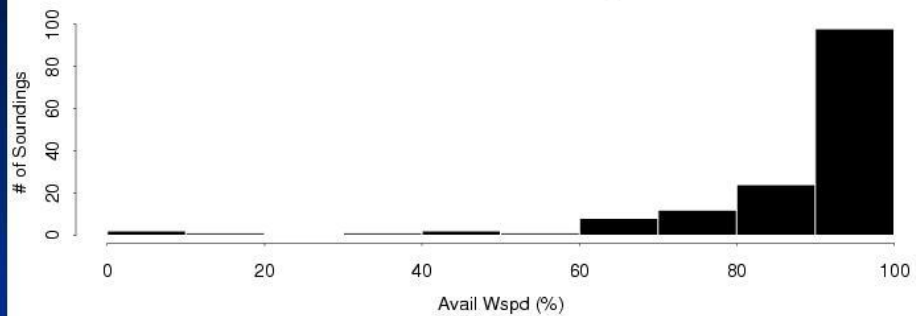
GAUS: Vaisala RS92

- Code-correlating GPS
- Digital transmission
- Twin Humicaps
- New ground check set

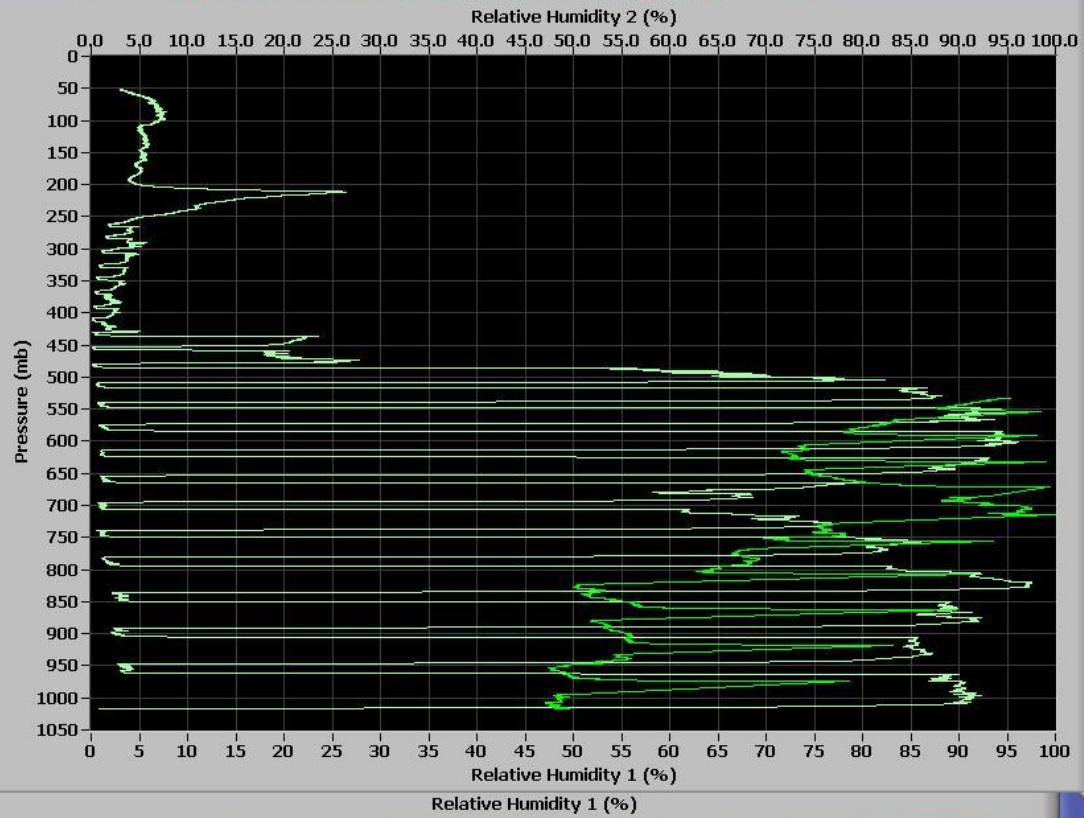


Wind availability for each sounding

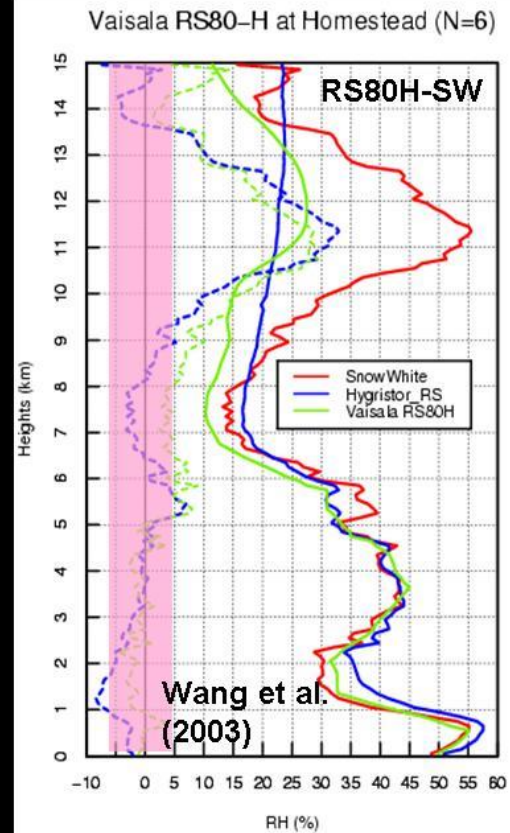
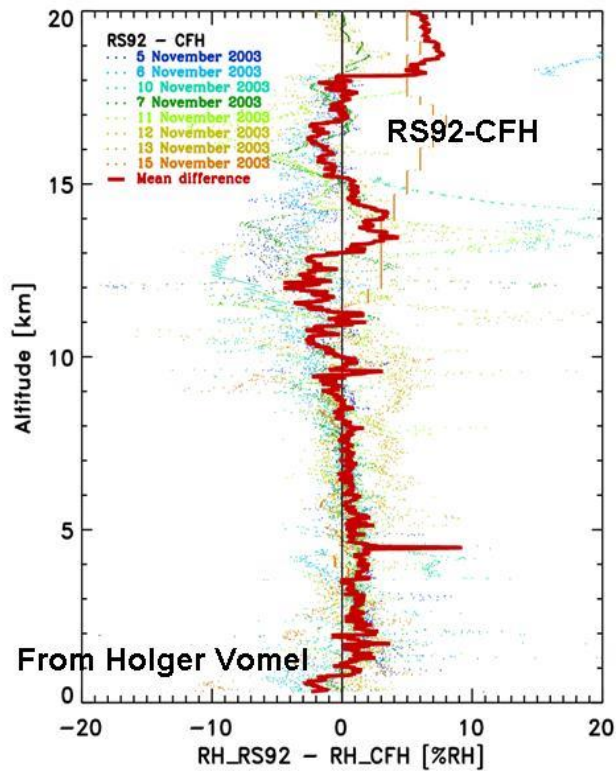
RICO 2004 GAUS Soundings N= 149



Good/Bad Humidity Sensors



RS92/RS80H vs Hygrometer, Oklahoma



GAUS data post-processing for RICO

GAUS raw D file ("DR")

1. Remove balloon swing 
2. Make radiation correction 
3. Study the performance of using CRC flags for removing bad data points
4. Make overall statistics (early termination, U/D sondes, % of good data points and so on)

GAUS processed D file ("DP")

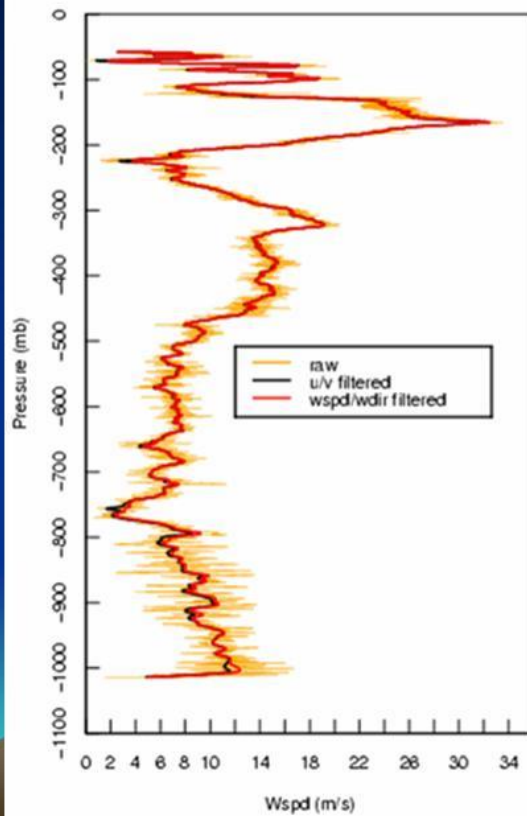
1. Study the quality of descending data 
2. Merge multiple files to one file
3. Separate ascending and descending data to two files
4. Conduct regular QC procedures to DP files (visual examination, sfc comparisons, etc)
5. Determine whether ASPEN or other QCs needed for the data

GAUS processed and QCed file ("DPQ")

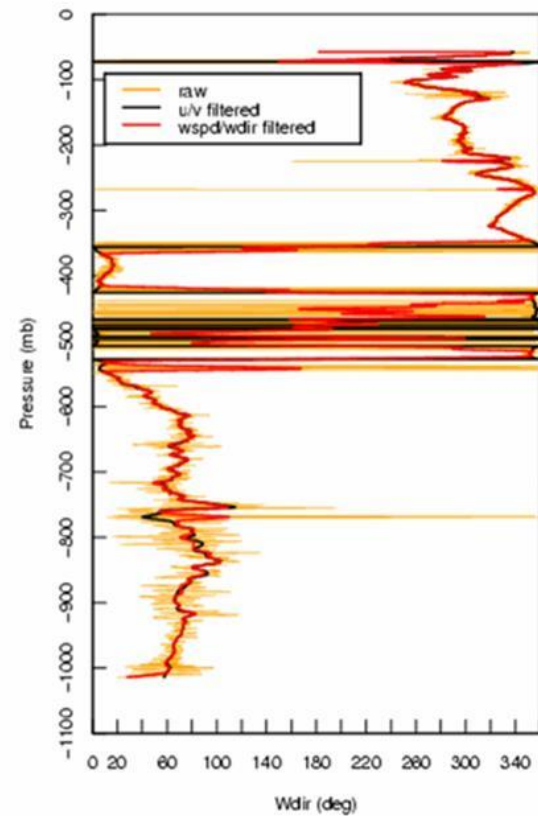
Release DPQ files (text format, 1 second)

Removing Balloon Swing: 40s low-pass filter

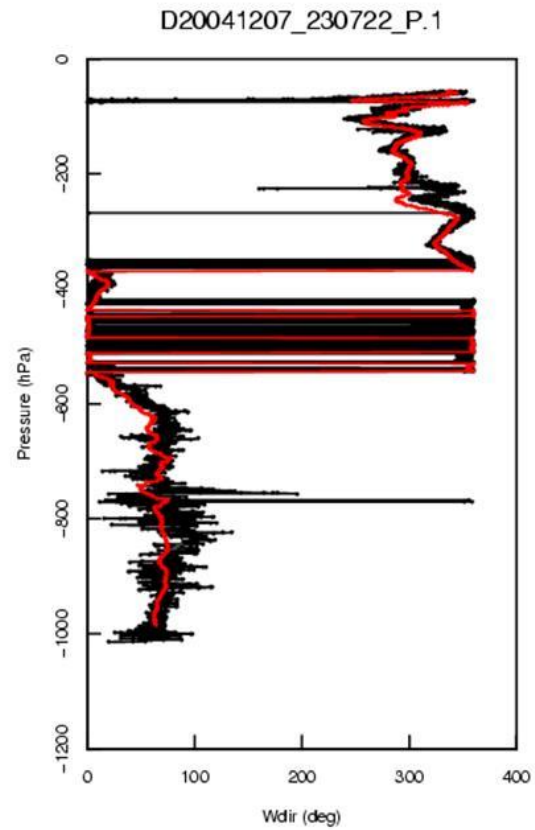
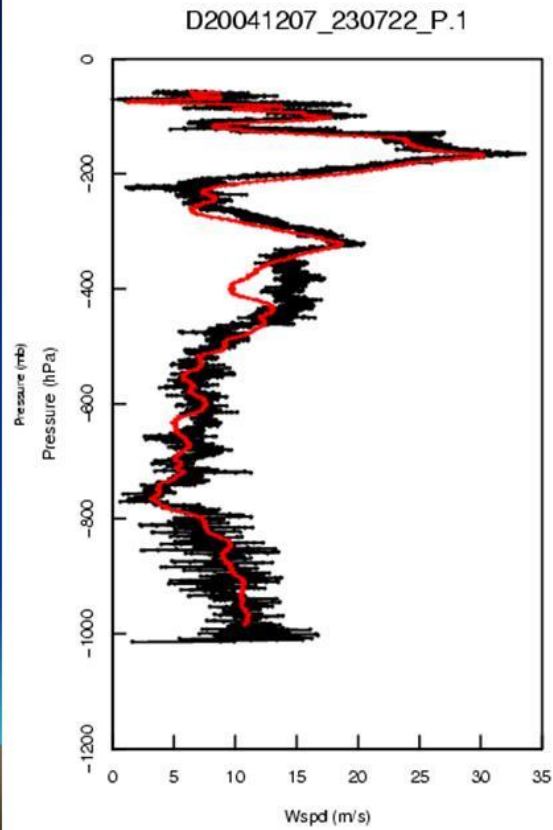
D20041207_230722_P.1a



D20041207_230722_P.1a



Ascending/Descending Profiles



GAUS Data Format

```
GAUS-T01 STA 043937440 050413 225849.25
GAUS-T01 COM CHT CHT Air Air Rel Wind Wind Vert GPS GPS Geopoten GPS Sonde Sonde GPS Wind GPS
GAUS-T01 COM Sonde Date Time Press Temp Humid Dir Spd Veloc Longitude Latitude Altitude Wnd PHL RH2 Snd Error Altitud
GAUS-T01 COM ID y m d h m s (mb) (C) (%) (deg) (m/s) (m/s) (deg) (deg) (m) Sat (%) (%) Sat (m/s) (m)
GAUS-T01 A11 000000000 050413 230452.00 865.00 10.70 17.00 258.00 7.50 0.00 -119.727805 39.506958 1345.58 0 17.00 17.00 0 0.00 1345.7
GAUS-T01 LAU 043937440 050413 231457.74

GAUS-D01 P00 043937440 050413 230455.74 866.41 10.93 22.60 316.32 0.15 -0.25 -119.727635 39.506965 99999.00 5 21.77 22.60 7 3.60 1344.6
GAUS-D01 P00 043937440 050413 230456.74 866.40 10.84 22.21 166.69 0.27 0.09 -119.727637 39.506963 99999.00 5 21.45 22.21 7 3.60 1345.7
GAUS-D01 P00 043937440 050413 230457.74 866.34 11.06 22.25 58.23 0.35 -0.11 -119.727628 39.506962 99999.00 5 21.83 22.25 7 3.60 1347.8
GAUS-D01 P00 043937440 050413 230458.74 866.34 11.06 22.25 31.66 0.15 -0.17 -119.727642 39.506977 99999.00 5 22.72 22.99 7 3.60 1345.8
GAUS-D01 P00 043937440 050413 230500.74 866.25 11.01 22.54 264.10 0.36 0.57 -119.727634 39.506964 1332.85 5 21.92 22.28 7 3.60 1345.7
GAUS-D01 P00 043937440 050413 230501.74 866.27 10.62 21.64 16.74 0.20 -0.09 -119.727633 39.506968 1333.41 5 21.44 21.64 7 3.60 1344.8
GAUS-D01 P00 043937440 050413 230502.74 866.28 10.68 21.95 218.68 0.15 0.27 -119.727605 39.506968 1333.30 5 21.74 21.95 7 3.60 1348.0

GAUS-D01 S00 043937440 050413 231457.74 866.14 9.94 20.92 261.48 0.93 0.43 -119.727752 39.506933 1334.55 7 20.92 999.00 8 2.00 1324.8
GAUS-D01 S00 043937440 050413 231458.74 865.88 9.28 19.89 273.46 3.54 2.01 -119.727716 39.506942 1337.07 7 19.89 999.00 8 2.00 1329.1
GAUS-D01 S00 043937440 050413 231459.74 865.47 7.79 18.46 235.54 6.99 3.30 -119.727648 39.506975 1340.95 7 18.46 999.00 8 2.00 1331.9
GAUS-D01 S00 043937440 050413 231500.74 865.29 7.79 18.55 244.98 9.25 4.34 -119.727537 39.506986 1344.56 7 18.55 999.00 8 2.00 1336.0
GAUS-D01 S00 043937440 050413 231501.74 864.99 6.44 17.96 260.64 12.00 4.86 -119.727401 39.507011 1348.04 7 17.96 999.00 8 2.00 1340.5
GAUS-D01 S00 043937440 050413 231502.74 864.26 6.83 18.47 254.05 14.15 3.91 -119.727243 39.507047 1352.48 7 18.47 999.00 8 2.00 1345.4
GAUS-D01 S00 043937440 050413 231503.74 863.70 6.44 18.64 259.49 13.85 5.42 -119.727105 39.507075 1357.77 7 18.64 999.00 8 2.00 1350.3
GAUS-D01 S00 043937440 050413 231504.74 863.27 6.55 19.33 275.82 12.20 4.25 -119.726968 39.507070 1361.91 7 19.33 999.00 8 2.00 1354.1
GAUS-D01 S00 043937440 050413 231505.74 862.64 6.39 19.13 278.09 12.81 6.05 -119.726811 39.507073 1367.81 7 19.13 0.14 8 2.00 1360.7

GAUS-D01 S11 000000000 050414 010222.74 9999.00 99.00 999.00 999.00 999.00 999.00 999.000000 99.000000 99999.00 0 999.00 999.00 0 99.00 99999.0
GAUS-D01 S11 000000000 050414 010223.74 9999.00 99.00 999.00 999.00 999.00 999.00 999.000000 99.000000 99999.00 0 999.00 999.00 0 99.00 99999.0
GAUS-T01 COM Data Type/Data Channel: GAUS SOUNDING DATA, Channel 1
GAUS-T01 COM Project Name/Mission ID: Hallett Obs Net Class, Class #1
GAUS-T01 COM Launch Time (y,m,d,h,m,s): 2005/04/13, 23:04:52.25
GAUS-T01 COM Sounding Name: none
GAUS-T01 COM Sonde ID#/Type/Serial#: 043937440, 23937440, Vaisala RS92-SGP (ccGPS), RS92-SGP (binary coeff)
GAUS-T01 COM Sonde Frequency: 405.00 MHz
GAUS-T01 COM Sonde Baseline Errors (p,t,hl,h2): 0.0 mb, 0.0 C, 0.0 %, 0.0 %
GAUS-T01 COM Sonde Dynamic Errors (p,t,h): 0.0 mb, 0.0 C, 0.0 %
GAUS-T01 COM Pre-launch Obs Data System/Time: none, 23:04:52.00
GAUS-T01 COM Pre-launch Obs (p,t,d,h): 865.0 mb, 10.7 C, -13.4 C, 17.0 %
GAUS-T01 COM Pre-launch Obs (wd,ps): 258.0 deg, 7.5 m/s
GAUS-T01 COM Pre-launch Obs (lon,lat,alt): -119.727805 deg, 39.506958 deg, 1345.6 m, (119 43.6683'W, 39 30.4175'N)
GAUS-T01 COM Operator Name/Comments: none, Great Sounding. 1st one with the students.
GAUS-T01 COM Standard Comments: none
GAUS-T01 COM Software Version 2.2.1 - 17 Feb 2005; Adds: bug fix
GAUS-T01 COM Format: Version NOAA 1.6 - 04 Mar 2004; Adds: timestamp resolution increased to 0.01 sec; GPS Lon & Lat resolution i
GAUS-T01 COM Met/Wind Offset: ptu data leads wind data by 0.00 sec
GAUS-T01 END 043937440 050414 010331.64
```

Header (A11, LAU)

Pre-launch (PXX)

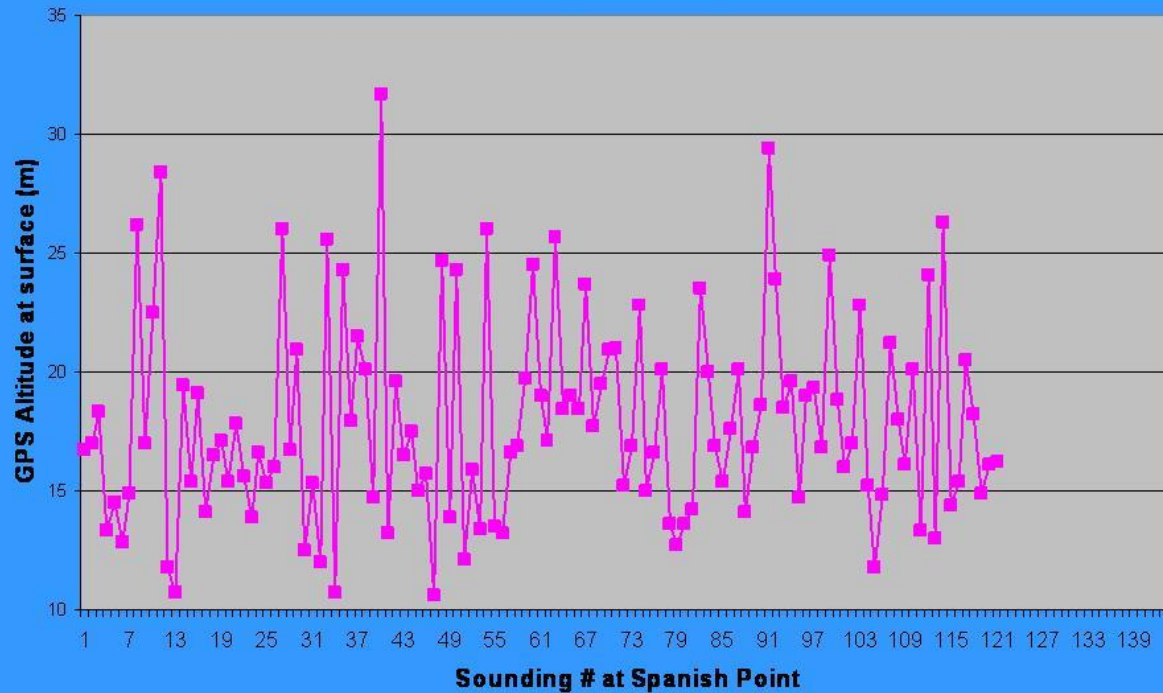
Sonde (SXX)

Tail



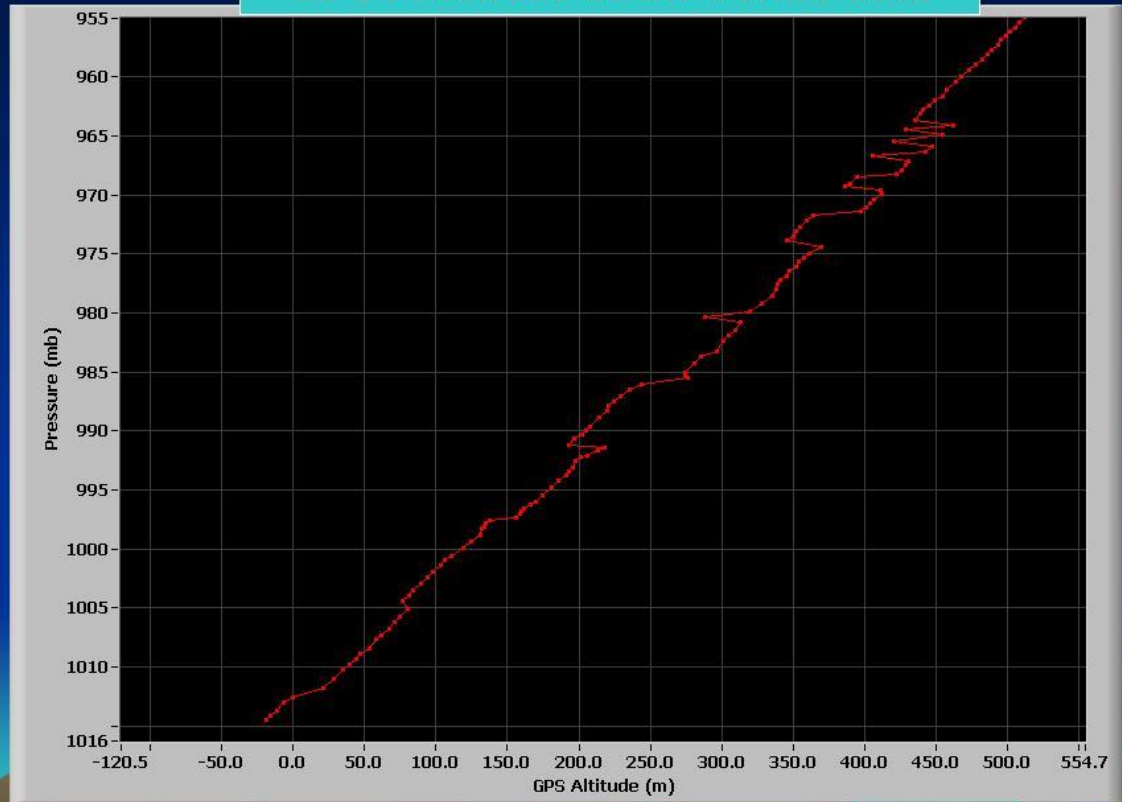
GPS Altitudes at the surface

RICO soundings at Spanish Point



No Geopotential Altitudes were calculated (all 0 values for "Geo. Alt." column)

GPS Altitudes in the sonde data



Importance Notes for RICO radiosonde data

- **Take precautions about descending data:**
 - Time lag for temperature and RH, especially larger for RH,
 - Low vertical resolution because of no parachute,
 - No filtering applied to descending wind data, but they are very clean.
- **Ignore prelaunch data:**
 - Use surface data from surface sensors on Line A11
- **Altitude:**
 - No geopotential altitude data in the file,
 - Oscillations in the GPS altitude data,
 - Recalculate geopotential altitudes using real elevations at the sites.
- **Data format:**
 - GMT Time (hhmmss.ss): Time after launch = Time_SXX – Time_LAU
 - Use Column #8 (Relative Humidity) for RH and ignore RH1/RH2

Contacts: Kate Young (kbeierle@ucar.edu)

June Wang (junhong@ucar.edu)



Interactions among data management team, engineering team and users

Data Management

Better
Raw
Data,
Understanding
Data
Collection
procedures

Perform
Data
Analysis

High
Quality-
Controlled
Data

???

Engineering/Operators

Users



NCAR