

N49RF ERROR SUMMARY  
Tropical Storm Laura

Flight ID: 20200824N1

| Sensor or System<br>-----            | Number or Name<br>----- |
|--------------------------------------|-------------------------|
| Static Pressure Probe                | PSM.2                   |
| Dynamic Pressure Probe               | PQM.2                   |
| Total Temperature Probe              | TTM.1                   |
| Dewpoint Temp. Probe                 | TDM.2                   |
| Vertical Accelerometer               | AccZI.1                 |
| Altimeter                            | AltGPS.3                |
| INE Selection                        | 1                       |
| Differential Attack Pressure Probe   | PDALPHA.2               |
| Differential Sideslip Pressure Probe | PDBETA.2                |
| Dynamic Attack Pressure Probe        | PQALPHA.2               |
| Dynamic Sideslip Pressure Probe      | PQBETA.2                |

Flight Directory                   acdata/2020/MET/20200824N1

|                       |                      |                      |
|-----------------------|----------------------|----------------------|
| Local Met Data        | Takeoff KLAL (0527Z) | Landing KLAL (1310Z) |
| Dynamic Corrections   |                      | Yes                  |
| AttackAngleIntercept  |                      | 3.97801              |
| AttackAngleSlope      |                      | 3.86172              |
| SlipAngleIntercept    |                      | 1.258                |
| SlipAngleSlope        |                      | 6.69941              |
| AttackAngleIntercept2 |                      | 5.05753              |
| AttackAngleSlope2     |                      | 5.52397              |
| SlipAngleIntercept2   |                      | 0.931                |
| SlipAngleSlope2       |                      | 6.57562              |

Notes:

There were no edits made in the measured parameters used to calculate meteorological and navigational parameters.  
Altra.1 has multiple significant dropouts and should not be used as absolute altitude.  
PQBeta.1 and PQBeta.2 are unrepresentative with unusual drop outs.  
When examined at high resolution, data from the three inertials (IRUs) shows "stairstepping" for all parameters w intervals generally less than 15 seconds  
TDM.1 & TDM.2 were unrepresentative for the cruise portion of the mission above 41K and also for intervals at low altitudes.  
Consider all relative humidity values to be considered suspect.  
TTM.3 has a small amplitude (magnitude 0.2 - 0.3 deg C) unnatural oscillation with a period of roughly 30 seconds.  
TTM.1 was used for calculation of Ambient Temperature (TA) and other derived parameters.  
Takeoff/Landing data: Data during landing and takeoff are potentially suspect. It is recommended that ground data not be used for scientific analysis.

| Expendable Type<br>----- | # deployed<br>----- | # good<br>----- | # transmitted<br>----- |
|--------------------------|---------------------|-----------------|------------------------|
| Dropsondes               | 38                  | 29              | 29                     |
| Test sondes              | 0                   | 0               | 0                      |
| AXBts                    | 0                   | 0               | 0                      |
| AXCPs                    | 0                   | 0               | 0                      |
| AXCTDs                   | 0                   | 0               | 0                      |
| UAS                      | 0                   | 0               | 0                      |

Flight Director: Henning  
Phone #: (863) 500-3982

ACAT-4 Version = 7.3

**U.S. Department of Commerce / NOAA / OMAO / Aircraft Operations Center - N49RF Manifest**

| FLIGHT INFORMATION               |             |             |             | CREW MANIFEST |            |                         | MISSION INFORMATION |                   |            |          |           |
|----------------------------------|-------------|-------------|-------------|---------------|------------|-------------------------|---------------------|-------------------|------------|----------|-----------|
| FLT ID:                          | 20200824N1  | FLT #:      |             | AC:           | Waddington | Scientists:             | Pressure            |                   | Dropsondes |          |           |
| From:                            | KLAL        | ETD:        | 0530z       | CP(s):        | Norman     |                         | A/C Takeoff         |                   | Good       | Bad      | Sent      |
| To:                              | KLAL        | ETA:        | 1330z       |               | Varwig     |                         |                     |                   | <b>29</b>  | <b>9</b> | <b>29</b> |
| Block Time                       |             | Flight Time |             | NAV:          |            | ASOS Takeoff            |                     | BTs               |            |          |           |
| In:                              | <b>1316</b> | Land:       | <b>1310</b> | FE(s):        |            |                         |                     | Good              | Bad        | Sent     |           |
| Out:                             | <b>0516</b> | T/O:        | <b>0527</b> | FD(s):        | Henning    | A/C Land                |                     |                   |            |          |           |
| Total:                           | <b>8.0</b>  | Total:      | <b>7.7</b>  |               | SSA:       |                         |                     |                   |            |          | Miller    |
| Sponsoring Org:                  | NHC         |             |             | SEB:          |            | Storm Number ID:        |                     | AL132020          |            |          |           |
| Program:                         | PHS         |             |             |               |            | (ie: AL072012)          |                     |                   |            |          |           |
| Purpose:                         | TS LAURA    |             |             | MX:           |            | TCPOD/WSPOD Mission     |                     | NOAA9 0913A LAURA |            |          |           |
|                                  |             |             |             |               |            | (ie: NOAA2 2418A SANDY) |                     |                   |            |          |           |
| AS REQUIRED BY ORM               |             |             |             | Y             | N          | REMARKS                 |                     | Fix Number        | Obs Number | Fix Time | SLP       |
| VOLCANIC ASH                     |             |             |             |               | x          |                         |                     |                   |            |          |           |
| SCIENCE MISSION WITHIN BDY LAYER |             |             |             |               |            |                         |                     |                   |            |          |           |
| LACK OF PRECIPITATION            |             |             |             |               |            |                         |                     |                   |            |          |           |
| RELATIVE HUMIDITY ≥ 80%          |             |             |             |               |            |                         |                     |                   |            |          |           |
| LARGE AIR-SEA TEMP GRADIENT      |             |             |             |               |            |                         |                     |                   |            |          |           |
| HIGH SURFACE WINDS               |             |             |             |               |            |                         |                     |                   |            |          |           |
| LONG FETCH / DURATION OF SFC WND |             |             |             |               |            |                         |                     |                   |            |          |           |
| SEA SALT ACCRETION FORECAST      |             |             |             |               |            |                         |                     |                   |            |          |           |
| SEA SALT ACCRETION OBSERVED      |             |             |             |               |            |                         |                     |                   |            |          |           |
|                                  |             |             |             |               |            |                         |                     | <b>Pennies:</b>   |            |          |           |

\*Highlighted items must be completed before departure.

Remarks:

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## G-IV QC Checklist

|                    |   |
|--------------------|---|
| Overall Assessment | Minor instrument issue(s) - minimal mission impact. |
|--------------------|---|

|                     |                    |
|---------------------|--------------------|
| Flight ID:          | 20200824N1         |
| Flight Director(s): | Henning / Kalen    |
| Mission:            | Tasked/Operational |
| UWZ.d mean:         | 0.2                |

| Pressure Comparison |        |        |
|---------------------|--------|--------|
|                     | T/O    | Land   |
| Aircraft            | 1010.0 | 1010.8 |
| Tower               | 1009.6 | 1010.6 |

|   | Raw 1Hz Mean File Parameters                  |  |   |   | C File Parameters                              |  |
|---|---|--|---|---|--|--|
| <input type="checkbox"/> Accelerometer      | <input checked="" type="checkbox"/> AccAXI.1  | <input checked="" type="checkbox"/> AccAYI.1     | <input checked="" type="checkbox"/> AccAZI.1    | <input checked="" type="checkbox"/> AccZI.1     | <input checked="" type="checkbox"/> AccZref    |  |
|   | <input checked="" type="checkbox"/> AccAXI.2  | <input checked="" type="checkbox"/> AccAYI.2     | <input checked="" type="checkbox"/> AccAZI.2    | <input checked="" type="checkbox"/> AccZI.2     |  |  |
|   | <input checked="" type="checkbox"/> AccAXI.3  | <input checked="" type="checkbox"/> AccAYI.3     | <input checked="" type="checkbox"/> AccAZI.3    | <input checked="" type="checkbox"/> AccZI.3     |  |  |
| <input type="checkbox"/> Altitude           | <input checked="" type="checkbox"/> AltGPS.1  | <input checked="" type="checkbox"/> AltI.1       | <input checked="" type="checkbox"/> AltPaADDU.1 | <input checked="" type="checkbox"/> AltBCADDU.1 | <input checked="" type="checkbox"/> ALTref     |  |
|   | <input checked="" type="checkbox"/> AltGPS.2  | <input checked="" type="checkbox"/> AltI.2       | <input checked="" type="checkbox"/> AltPaADDU.2 | <input checked="" type="checkbox"/> AltBCADDU.2 | <input checked="" type="checkbox"/> ALTPA.d    |  |
|   | <input checked="" type="checkbox"/> AltGPS.3  | <input checked="" type="checkbox"/> AltI.3       | <input checked="" type="checkbox"/> AltRA.1     |   | <input checked="" type="checkbox"/> ALTGA.d    |  |
| <input type="checkbox"/> Ground Speed       | <input checked="" type="checkbox"/> GsXI.1    | <input checked="" type="checkbox"/> GsYI.1       | <input checked="" type="checkbox"/> GsZI.1      | <input checked="" type="checkbox"/> GsGPS.1     | <input checked="" type="checkbox"/> GSXref     |  |
|   | <input checked="" type="checkbox"/> GsXI.2    | <input checked="" type="checkbox"/> GsYI.2       | <input checked="" type="checkbox"/> GsZI.2      | <input checked="" type="checkbox"/> GsGPS.2     | <input checked="" type="checkbox"/> GSYref     |  |
|   | <input checked="" type="checkbox"/> GsXI.3    | <input checked="" type="checkbox"/> GsYI.3       | <input checked="" type="checkbox"/> GsZI.3      |   | <input checked="" type="checkbox"/> GSZref     |  |
|   | <input checked="" type="checkbox"/> GsXGPS.1  | <input checked="" type="checkbox"/> GsYGPS.1     | <input checked="" type="checkbox"/> GsZGPS.1    |   |  |  |
|   | <input checked="" type="checkbox"/> GsXGPS.2  | <input checked="" type="checkbox"/> GsYGPS.2     | <input checked="" type="checkbox"/> GsZGPS.2    |   |  |  |
| <input type="checkbox"/> Lat / Lon          | <input checked="" type="checkbox"/> LatGPS.1  | <input checked="" type="checkbox"/> LatI.1       | <input checked="" type="checkbox"/> LonGPS.1    | <input checked="" type="checkbox"/> LonI.1      | <input checked="" type="checkbox"/> LATref     |  |
|   | <input checked="" type="checkbox"/> LatGPS.2  | <input checked="" type="checkbox"/> LatI.2       | <input checked="" type="checkbox"/> LonGPS.2    | <input checked="" type="checkbox"/> LonI.2      | <input checked="" type="checkbox"/> LONref     |  |
|   | <input checked="" type="checkbox"/> LatGPS.3  | <input checked="" type="checkbox"/> LatI.3       | <input checked="" type="checkbox"/> LonGPS.3    | <input checked="" type="checkbox"/> LonI.3      |  |  |
| <input type="checkbox"/> Pressure           | <input checked="" type="checkbox"/> PDALPHA.1 | <input checked="" type="checkbox"/> PQALPHA.1    | <input checked="" type="checkbox"/> PQM.1       | <input checked="" type="checkbox"/> PSM.1       | <input checked="" type="checkbox"/> PDALPHAref | <input checked="" type="checkbox"/> PQMref |
|   | <input checked="" type="checkbox"/> PDALPHA.2 | <input checked="" type="checkbox"/> PQALPHA.2    | <input checked="" type="checkbox"/> PQM.2       | <input checked="" type="checkbox"/> PSM.2       | <input checked="" type="checkbox"/> PDBETAref  | <input checked="" type="checkbox"/> PQ.c   |
|   | <input checked="" type="checkbox"/> PDBETA.1  | <input checked="" type="checkbox"/> PQBETA.1     |   |   | <input checked="" type="checkbox"/> PQALPHAref | <input checked="" type="checkbox"/> PSMref |
|   | <input checked="" type="checkbox"/> PDBETA.2  | <input checked="" type="checkbox"/> PQBETA.2     |   |   | <input checked="" type="checkbox"/> PQBETAref  | <input checked="" type="checkbox"/> PS.c   |
| <input type="checkbox"/> Air Speed          | <input checked="" type="checkbox"/> CasADDU.1 | <input checked="" type="checkbox"/> CasADDU.2    | <input checked="" type="checkbox"/> TasADDU.1   | <input checked="" type="checkbox"/> TasADDU.2   | <input checked="" type="checkbox"/> IAS.d      | <input checked="" type="checkbox"/> TAS.d  |
| <input type="checkbox"/> Pitch / Roll       | <input checked="" type="checkbox"/> PitchI.1  | <input checked="" type="checkbox"/> PitchRatel.1 | <input checked="" type="checkbox"/> RollI.1     | <input checked="" type="checkbox"/> RollRatel.1 | <input checked="" type="checkbox"/> PITCHref   |  |
|   | <input checked="" type="checkbox"/> PitchI.2  | <input checked="" type="checkbox"/> PitchRatel.2 | <input checked="" type="checkbox"/> RollI.2     | <input checked="" type="checkbox"/> RollRatel.2 | <input checked="" type="checkbox"/> ROLLref    |  |
|   | <input checked="" type="checkbox"/> PitchI.3  | <input checked="" type="checkbox"/> PitchRatel.3 | <input checked="" type="checkbox"/> RollI.3     | <input checked="" type="checkbox"/> RollRatel.3 |  |  |
| <input type="checkbox"/> Temp / Dewpt       | <input checked="" type="checkbox"/> TTM.1     | <input checked="" type="checkbox"/> TTM.4        | <input checked="" type="checkbox"/> TDM.1       |   | <input checked="" type="checkbox"/> TD.c       | <input checked="" type="checkbox"/> TTMref |
|   | <input type="checkbox"/> TTM.2                |  | <input checked="" type="checkbox"/> TDM.2       |   | <input checked="" type="checkbox"/> TDMref     | <input checked="" type="checkbox"/> TA.d   |
|   | <input checked="" type="checkbox"/> TTM.3     |  |   |   |  |  |
| <input type="checkbox"/> Misc. (Must check) |   |  |   |   | <input checked="" type="checkbox"/> UWZ.d      | <input checked="" type="checkbox"/> WS.d   |
|   |   |  |   |   | <input checked="" type="checkbox"/> DPJ_WSZ    | <input checked="" type="checkbox"/> WD.d   |
|   |   |  |   |   | <input checked="" type="checkbox"/> HUM        |  |

| FLID_Mission_Documents.pdf.  |
|--|
| <input checked="" type="checkbox"/> Error Summary                                    |
| <input checked="" type="checkbox"/> Crew Manifest                                    |
| <input checked="" type="checkbox"/> QC Checklist                                     |
| <input checked="" type="checkbox"/> Dropwindsonde Log(s) - AVAPS and FD if completed |
| <input checked="" type="checkbox"/> Flight Track                                     |
| <input checked="" type="checkbox"/> Miscellaneous FD Notes                           |

| QC Key        |                                     |
|---------------|-------------------------------------|
| Not checked   | <input type="checkbox"/>            |
| Valid         | <input checked="" type="checkbox"/> |
| Errors (note) | <input checked="" type="checkbox"/> |

| NOTES:  |
|---|
| <p>AltRA.1 has multiple significant dropouts and should not be used as absolute altitude.</p> <p>PQBeta.1 and PQBeta.2 are unrepresentative with unusual drop outs.</p> <p>When examined at high resolution, data from the three inertials (IRUs) shows "stairstepping" for all parameters intervals (generally less than 15 seconds).</p> <p>TDM.1 &amp; TDM.2 were unrepresentative for the cruise portion of the mission above 41K and also for intervals at low altitudes. Consider all relative humidity values to be considered suspect.</p> <p>TTM.3 has a small amplitude (magnitude 0.2 - 0.3 deg C) unnatural oscillation with a period of roughly 30 seconds.</p> <p>TTM.1 was used for calculation of Ambient Temperature (TA) and other derived parameters.</p> <p>There were no edits made in the measured parameters used to calculate meteorological and navigational parameters.</p> <p>Takeoff/Landing data: Data during landing and takeoff are potentially suspect</p> <p>It is recommended that ground data not be used for scientific analysis.</p> |

AOC GPS Dropwindsonde Log (updated Mar 2019)

Flight ID: 20200824N1

ASPEN Operator/Flight Director(s): Kalen / Henning

Mission ID: NOAA9 M13A

Storm Name/Track: TS Laura

PG      of     

| Sonde # | Ob # | Launch Time HHMMSS (Z) | Sonde ID (min last 5) | Ch # used | Lat (°N) | Lon (°E) | Prominent Wx Cond. | SFC Prs (mb) | Comments / Issues / QC / ASPEN Edits | KWBC # | Sonde Issues? |
|---------|------|------------------------|-----------------------|-----------|----------|----------|--------------------|--------------|--------------------------------------|--------|---------------|
| 1       | 1    | 055553                 | 50230                 | 1         | 27.00    | -78.98   |                    | 1014.2       | 12529                                | 240621 | N             |
| 2       | 2    | 061154                 | 20804                 | 2         | 27.00    | -76.92   |                    | 1016.8       | 12526 / Ignore FLW                   | 240629 | N             |
| 3       | 3    | 062625                 | 31019                 | 3         | 26.87    | -75.08   |                    | 1016.8       | 12020                                | 240644 | N             |
| 4       | 4    | 064115                 | 10750                 | 4         | 25.08    | -75.13   |                    | 1015.1       | 10521 / Ignore FLW                   | 240702 | N             |
| 5       | 5    | 065502                 | 61091                 | 1         | 25.00    | -77.07   |                    | 1014.4       | 10027                                | 240716 | N             |
| 6       | 6    | 070831                 | 61152                 | 2         | 24.82    | -78.89   |                    | 1011.3       | 10522 / Ignore FLW                   | 240728 | N             |
| 7       | 7    | 071531                 | 50229                 | 3         | 24.02    | -78.69   |                    | 1011.1       | 08526                                | 240734 | N             |
| 8       | 8    | 072144                 | 61150                 | 4         | 23.32    | -78.4    |                    | 1009.6       | 10532 / Ignore FLW                   | 240757 | N             |
| 9       | 9    | 073522                 | 61087                 | 1         | 22.93    | -76.68   |                    | 1010.6       | 10536 / Ignore FLW                   | 240801 | N             |
| 10      | -    | 074739                 | 61103                 | 2         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 11      | -    | 075201                 |                       | 3         | -        | -        | -                  | -            | No DATA                              | -      | Y             |
| 12      | 10   | 080047                 | 61149                 | 3         | 22.08    | -74.39   |                    | 1011.6       | 12026 / Ignore FLW                   | 240822 | N             |
| 13      | 11   | 081628                 | 30946                 | 4         | 20.21    | -73.80   |                    | 1011.4       | 11021                                | 240832 | N             |
| 14      | 12   | 083019                 | 20795                 | 1         | 19.00    | -75.13   |                    | 1010.8       | 10513                                | 240850 | N             |
| 15      | -    | 084040                 | 40048                 | 2         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 16      | 13   | 084215                 | 20797                 | 3         | 17.93    | -76.20   |                    | 1009.8       | 21511                                | 240901 | N             |
| 17      | 14   | 085037                 | 70039                 | 4         | 17.75    | -77.24   |                    | 1009.0       | 15516                                | 240920 | N             |
| 18      | 15   | 090953                 | 70038                 | 1         | 18.07    | -79.61   |                    | 1005.5       | Set Heights Missing                  | 240926 | Y             |
| 19      | -    | 092434                 | 30007                 | 2         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 20      | -    | 092521                 | 30021                 | 3         | -        | -        | -                  | -            | No Launch Detect                     | -      | Y             |
| 21      | 16   | 092859                 | 20838                 | 4         | 18.77    | -81.88   |                    | 1007.3       | 27016 / Ignore FLW                   | 240950 | N             |
| 22      | 17   | 093458                 | 61104                 | 1         | 19.20    | -82.54   |                    | 1006.1       | 28519 / Ignore FLW                   | 240959 | N             |
| 23      | 18   | 094721                 | 50231                 | 2         | 20.21    | -83.81   |                    | 1006.7       | 32018 / Ignore FLW                   | 241007 | N             |
| 24      | 19   | 100209                 | 70037                 | 3         | 21.33    | -85.39   |                    | 1006.4       | 01505 / Ignore FLW                   | 241028 | N             |
| 25      | -    | 101826                 | 40052                 | 4         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 26      | -    | 101926                 | 61151                 | 1         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 27      | 20   | 102148                 | 20840                 | 2         | 23.40    | -85.58   |                    | 1008.7       | 02005 / Ignore FLW                   | 241045 | N             |
| 28      | 21   | 103356                 | 20802                 | 3         | 23.69    | -84.08   |                    | 1008.8       | 06012 / Ignore FLW                   | 241100 | N             |
| 29      | -    | 104847                 | 50232                 | 4         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 30      | -    | 104955                 | 61101                 | 1         | -        | -        | -                  | -            | No PTH                               | -      | Y             |
| 31      | 22   | 105214                 | 30188                 | 2         | 24.19    | -82.10   |                    | 1009.5       | 10025 / Ignore FLW                   | 241112 | N             |
| 32      | 23   | 110424                 | 20880                 | 3         | 25.61    | -82.21   |                    | 1010.7       | 10527 / Ignore FLW                   | 241125 | N             |
| 33      | 24   | 111822                 | 51115                 | 4         | 25.70    | -84.11   |                    | 1010.4       | 10517                                | 241143 | N             |
| 34      | 25   | 113330                 | 20816                 | 1         | 25.70    | -86.18   |                    | 1010.5       | 15511 / Ignore FLW                   | 241156 | N             |
| 35      | 26   | 114720                 | 10549                 | 2         | 25.80    | -88.00   |                    | 1010.2       | 22014 / Ignore FLW                   | 241207 | N             |
| 36      | 27   | 120231                 | 20791                 | 3         | 27.62    | -87.97   |                    | 1008.2       | 17523 / Ignore FLW                   | 241221 | N             |
| 37      | 28   | 121649                 | 20878                 | 4         | 27.69    | -86.08   |                    | 1010.1       | 16522 / Ignore FLW                   | 241236 | N             |
| 38      | 29   | 123143                 | 20734                 | 1         | 27.70    | -84.08   |                    | 1012.2       | 12021 / Ignore FLW / LAST REP        | 241250 | N             |

ASPEN Operator will ensure this form is delivered to the AOC Flight Director to be archived

COMMENTS:

Obs Xmitted

Obs Missed

# of sondes launched

# of bad sondes

2020-08-24, 04:48:39-13:17:08

