| **MISSION PLAN** | | | |
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| **FLIGHT ID** | 20230912I1 | **STORM** | AL13 / Lee |
| **MISSION ID** | 2213A LEE | **TAIL NUMBER** | NOAA 43 |
| **TASKING** | NHC/EMC | **PLANNED PATTERN** | Butterfly pattern with 105 NM legs |
| **MISSION SUMMARY** | | | |
| **TAKEOFF [UTC]** | 0831 | **LANDING [UTC]** | 1453 |
| **TAKEOFF LOCATION** | TISX | **LANDING LOCATION** | TISX |
| **FLIGHT TIME** | 6.4 | **BLOCK TIME** | 6.6 |
| **TOTAL REAL-TIME RADAR ANALYSES**  **(Transmitted)** | 3 (3) | **TOTAL DROPSONDES Deployed (Transmitted)** | 29 (28) all NWS |
| **OCEAN EXPENDABLES (Type)** | 5 (4) AXBT | **sUAS (Type)** | n/a |
| **APHEX EXPERIMENTS / MODULES** | n/a | | |
| **HRD CREW MANIFEST** | | | |
| **LPS ONBOARD** | Aberson | **LPS GROUND** | Marks |
| **TDR ONBOARD** | Aberson | **TDR GROUND** | Reasor/Alvey |
| **ASPEN ONBOARD** | J. Zhang/Ko | **ASPEN GROUND** | n/a |
| **NESDIS SCIENTISTS** | n/a | | |
| **GUESTS (Affiliation)** | Kelly Ryan (UM/CIMAS) | | |
| **AOC CREW MANIFEST** | | | |
| **PILOTS** | Copare/Keith/Wood | | |
| **NAVIGATOR** | Utama | | |
| **FLIGHT ENGINEERS** | Tyson/Tufnell | | |
| **FLIGHT DIRECTOR** | Kalen/Lundry | | |
| **DATA TECHNICIAN** | Richards | | |
| **AVAPS** | Warneke/Kotz | | |

| **PRE-FLIGHT** | |
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| **Flight Plan** | * *8 or 10 kft (pressure altitude) depending on AF deconfliction requirements* |
| **Expendable Distribution** | * *Load 40 dropsondes*   + *Release at endpoints, midpoints, centers, RMWs (charged to NWS)*   + *Possible supplemental rapid RMW drops (charged to ONR)*   + *1 dropsonde near Saildrone 1064 if possible (GOMO)*   + *Additional drops may be requested at the discretion of the onboard HRD LPS*   + *All dropsondes transmitted to the GTS* * *8 AXBTs - see notes below*   + *All AXBTs transmitted to the AOC ground server if possible* |
| **Preflight Weather Briefing** | *Lee is still experiencing moderate shear as seen in the GFS initial analysis for 00Z 12 September*    *However, the ERC has not really completed and the larger outer eyewall has not contracted, and the remains of the inner eyewall is still pulsing with convective bursts as evidenced in the satellite loop.* |
| **Instrument Notes** | *All instruments but the WSRA are nominal. WSRA in inoperative* |

| **IN-FLIGHT** | |
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| **Time [UTC]** | **Event** |
| 0831 | Take-off from TISX, crabs on taxiway - LOL |
|  | 2 Saildrones are in the vicinity of Lee and along our flight track - SD-1041 is located very near our IP; SD-1064 passed very near the center of Lee and is located near the midpoint of the outbound leg from the center to PT#4 |
| 0912 | N49RF is doing their first circumnav and will pass just north of N43RF inbound track shortly. N49RF FL winds there is definitely westerly shear over Lee. FL winds are westerly all over the ENE side of the storm. |
| 0919 | Begin descent to 10 kft |
| 0931 | Passing through the outer band with sharp IR brightness gradient |
| 0934 | IP (PT#1)/Saildrone-1041 sonde (Drop #1), just inside the outer band, sonde splash 28.5 km SE of SD-1041 |
| 0938 | BT (AXBT #1) sst=28.39 |
| 0948 | Midpt. RMW sonde (Drop #2). No surface windspeed max in outer eyewall (SFMR 45 kt) |
| 0949 | New convective burst is going off in the inner eyewall again on the NE side of the center. Likely will advect along the outbound track. North side of the outer eyewall is looking very potent as well, with the coldest cloud tops.  Convective feature seen in SE inner eyewall on MMR. |
| 0953 | RMW sonde (Drop#3) |
| 0955 | RMW sonde (Drop #4) |
| 1001 | Center sonde/bt (Drop #5, AXBT #2), SST=28.34. 24.09N, 65.50W, 950 hPa  Two convective bursts on inside edge of inner eyewall, one N, one SE. Avoiding one to north on outbound leg. |
| 1007 | RMW sonde 1 (Drop #6) |
| 1008 | RMW sonde 2 (Drop #7), no launch detect on second RMW sonde.  N49 is starting their inner circumnav to the WNW side of the outer eyewall |
| 1015 | Midpt sonde (Drop #8) |
| 1019 | No reflectivity moat in NE quadrant, but there is a flight-level wind-speed maximum |
| 1026 | TDR Analysis #1 started |
| 1028 | Endpt (PT#2) sonde (Drop #9), no AXBT, passed very close to N49RF doing their inner circumnav. N49 FL winds on the N side of the outer eyewall suggests they passed very close to the flow stagnation point. |
| 1037 | TDR Analysis #1 completed  TDR center info from 230912I1\_1001\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 24.10 65.49  3.0 24.10 65.51  6.0 24.14 65.49  2-6-km Vortex Tilt: 4.0 km at 0 deg |
| 1101 | Endpt (PT#3) sonde combo (Drop #10, AXBT #3), SST=28.47, turn TK 120 |
| 1112 | Midpt outer eyewall sonde (Drop #11) |
| 1118 | Two inner eyewall sondes (Drops #12-13) |
| 1126 | CPA center (Drop #14) |
| 1130 | RMW sonde 1 (Drop #15) |
| 1133 | RMW sonde 2, (Drop #16), high FL, but SFMR never rose much |
| 1138 | RMW sonde 3 sonde (Drop #17), Outer eyewall gone |
| 1152 | midpt sonde (Drop #18) near Saildrone (SD-1064), drop splash 52 km from SD-1064 |
| 1204 | Endpt (PT#4) sonde and bt (Drop #19, AXBT #4) |
| 1205 | TDR Analysis #2 started |
| 1223 | TDR Analysis #2 completed:  TDR center info from 230912I1\_1125\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 24.14 65.64  3.0 24.15 65.62  6.0 24.21 65.60  2-6-km Vortex Tilt: 9.0 km at 27 deg |
| 1240 | Endpt (PT#5) combo drop (Drop #20, AXBT #5) TK 240, bad BT, found out that the WSRA is up, but only have WSRA on last leg |
| 1254 | Midpt drop (Drop #21) |
| 1302 | RMW drop 1 (Drop #22) |
| 1303 | RMW drops 2, 3 (Drops #23-24) |
| 1309 | Center (Drop #25) |
| 1314 | RMW drop 1 (Drop #26) |
| 1315 | RMW drop 2 (Drop #27) |
| 1321 | Midpt/RMW sonde (Drop #28) |
| 1330 | Endpt (PT#6) combo (Drop #29, AXBT#6), Mission end, head for TISX |
| 1331 | TDR Analysis #3 started |
| 1347 | TDR Analysis #3 completed  TDR center info from 230912I1\_1308\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 24.19 65.85  2.0 24.21 65.85  3.0 24.23 65.83  6.0 24.26 65.81  2-6-km Vortex Tilt: 7.2 km at 34 deg |
| 1453 | Landed TISX |
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| **POST-FLIGHT** | |
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| **Mission Summary** | * *Executed the butterfly pattern as planned.* * *Completed intercomparisons with 2 Saildrones (SD-1041, SD-1064) dropping sondes and AXBTs within 28.5 km and 52 km, respectively. SD-1041 was near the IP and SD-1064 was near midpoint of outbound leg from the center to PT#4.* * *Inner core structure changes during the mission were very interesting. On the first pass it was apparent that there were concentric eyewalls, however, by the 2nd and 3rd passes it appeared that the outer eyewall collapsed and that there was only a single larger eyewall present, particularly looking at the SFMR winds.* * *Really interesting shear vortex interactions. Looking at 49 and 43 FL data on the NW to SE semicircle. Appeared like there was a stagnation point in the 49 FL wind on the NNW side and a strange transition in the FL wind on the east side. Should be a very interesting data set when combining the 49 TDR analyses from their inner circumnav with the 43 TDR analyses* * *Excellent TDR/dropwindsonde coverage:* |
| **Actual Standard Pattern Flown** | *Butterfly* |
| **APHEX Experiments / Modules Flown** | *NA* |
| **Plain Language Summary** | *Very successful operationally tasked TDR mission:*   * *Produced 3 TDR analyses with radial wind files transmitted to EMC and NHC* * *Produced 29 dropsondes transmitted to EMC and NHC* * *On the first pass there were concentric eyewalls, however, on the 2nd and 3rd passes it appeared that the outer eyewall collapsed.* |
| **Instrument Notes** | *All the instruments worked well, but WSRA. Found out that the WSRA came back up late in the mission. Only available on the last leg from PT#5->6* |
| **Final Mission Track** |  |