S-HIS Flight Summary: 04-05 September 2013

Revision: 06 Sept 2013, J. Taylor, University of Wisconsin-Madison, SSEC

Summary:

S-HIS MTS products were unavailable Sept 4 1750 - 1924 UTC due to a network block placed on the S-HIS server at UW-Madison. Ku was intermittent during southern portion of flight leg around 0642 UTC. Complete S-HIS data will be available in post-processed products.

An anomalous S-HIS detector temperature rise was once again experienced on this flight. The detector temperature increased from its nominal value of 77K to 91 K by 0130 UTC (Sept 5). The detector temperature and instrument responsivity was closely monitored during the flight, and at 0145 UTC a power cycle of the S-HIS instrument was requested. The instrument was powered off for 17 minutes (goal: 15 minutes). The intent of this long power cycle was to 'reset' the cooler to nominal behavior. The on-duty Mission Scientist was consulted so that the timing of the power cycle did not impact critical science data. The instrument was powered back on at 0202 UTC, and the detector temperature and instrument responsivity returned to nominal values by 0224 UTC, and remained nominal for the remainder of the flight.

The increased detector temperature through 0130 UTC should have negligible effect on the quality of the science data for the flight, but we will review the processed data in further detail as soon as it's available to confirm this conclusion. We will continue to carefully monitor detector cooler performance for further degradation. A spare cooler is being prepared at UW-SSEC, but given the success of the cold restart of the cooler during this flight, a low risk option is to conduct cold restart earlier in the flight, perhaps prior to the start of science data.

There were a large number of high clouds and overshooting tops in the system, resulting in some interesting observations. SNPP and AQUA overpassed the system at roughly 0548 and 0549 UTC (Sept 5). The overpasses were roughly 285 and 150 nautical miles west of AV-6, respectively.

Timeline (All times are UTC and are only approximate):

- 20130904T1400 GH engine start
- 20130904T1427 Ku ON and transmitting
- 20130904T1503 SHIS Power on
- 20130904T1508 Takeoff
- 20130904T1730 S-HIS detector temperature increasing
- 20130904T1750 S-HIS processing computer and product server network locked at UW-Madison; S-HIS MTS products unavailable
- 20130904T1957 S-HIS processing computer and product server network locked at UW-Madison; S-HIS products available
- 20130905T0145 S-HIS power off (Power cycle attempt to restore detector temperature)
- 20130905T0202 S-HIS power on (Power cycle attempt to restore detector temperature)

- 20130905T0224 S-HIS detector temperatures return to nominal
- 20130905T1234 S-HIS descent heaters on
- 20130905T1248 Instrument power OFF before descent (IL42, IL41, DC42, DC41)
- 20130905T1304 Instrument power ON (DC41, DC42, IL41, IL42)
- 20130905T1339 Instrument power OFF (DC41, DC42, IL41, IL42)
- 20130905T1400 Landing

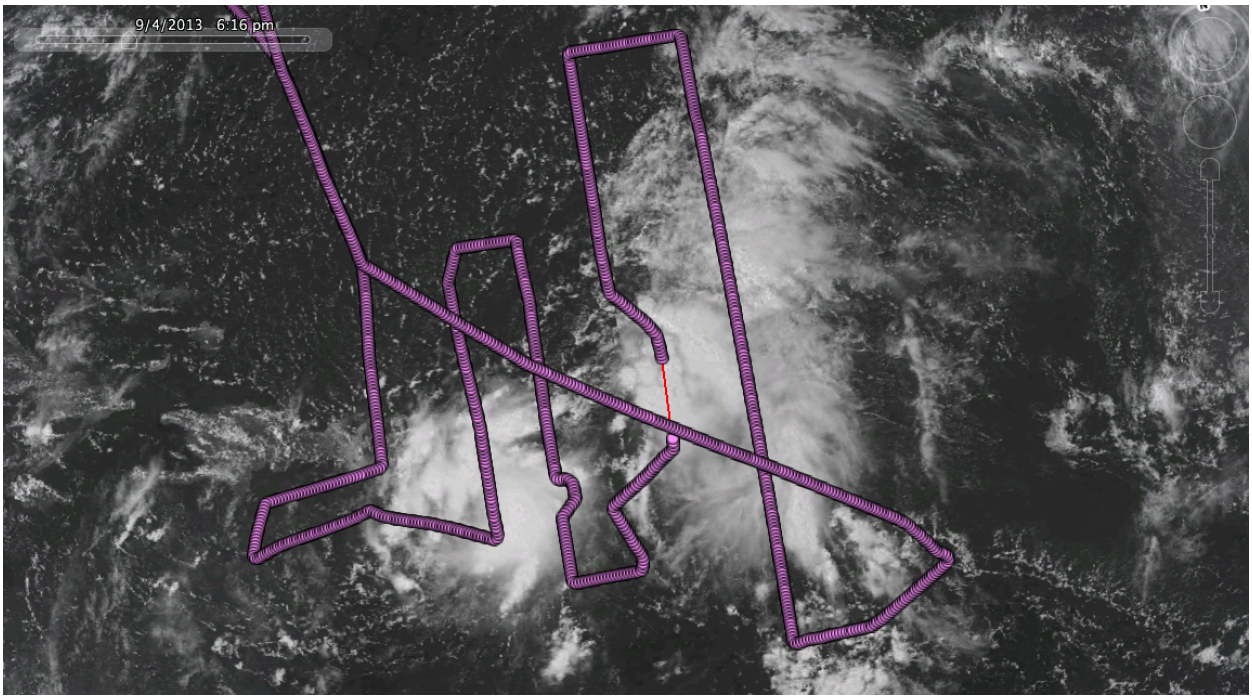

Figure 1: S-HIS power off from 20130905 0145 - 0202. Power off region indicated by red line. Detector temperature returned to nominal at 0224.

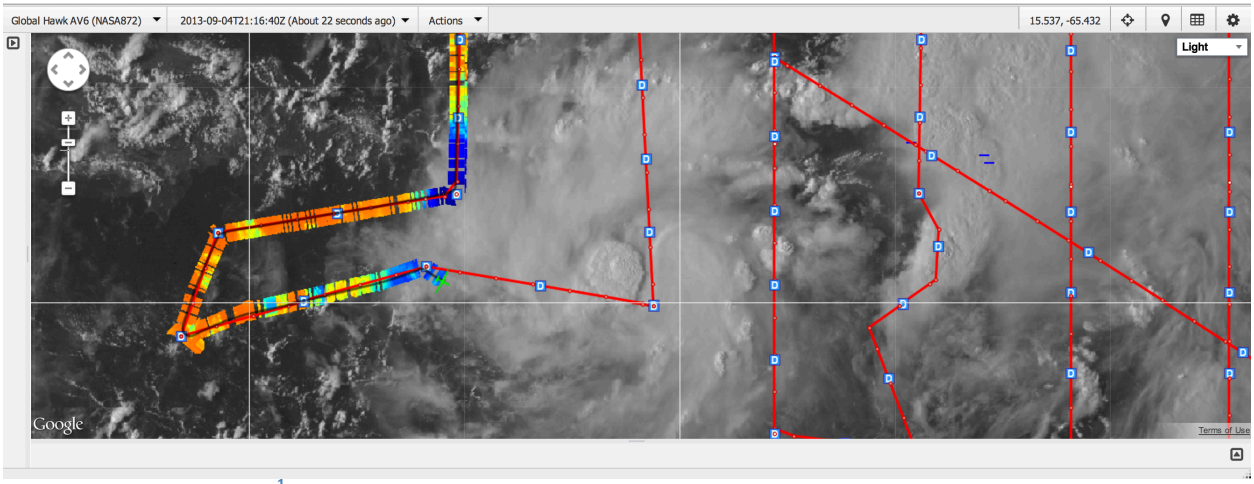

Figure 2: S-HIS 895-900 cm^{-1} Brightness Temperature image overlaid on GOES IR.

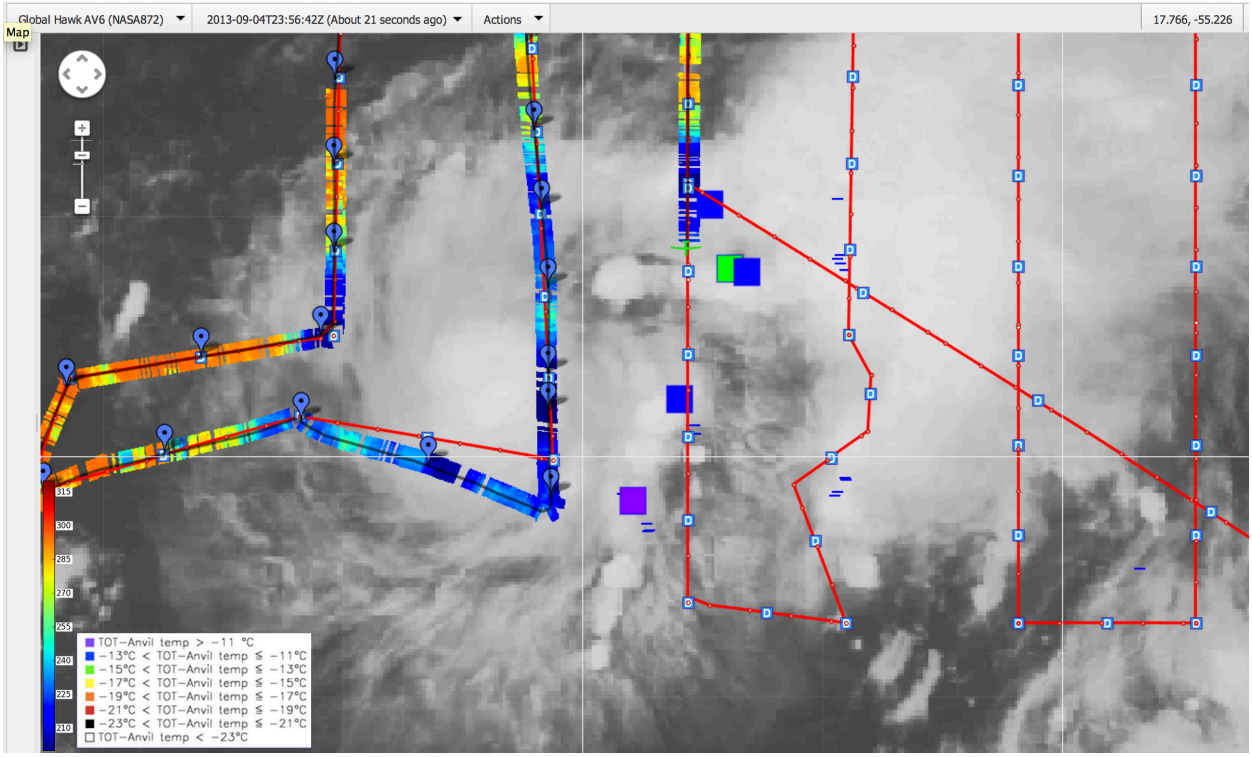

Figure 3: S-HIS 895-900 cm^{-1} Brightness Temperature image overlaid on GOES IR. Overshooting tops and lightning indicated.

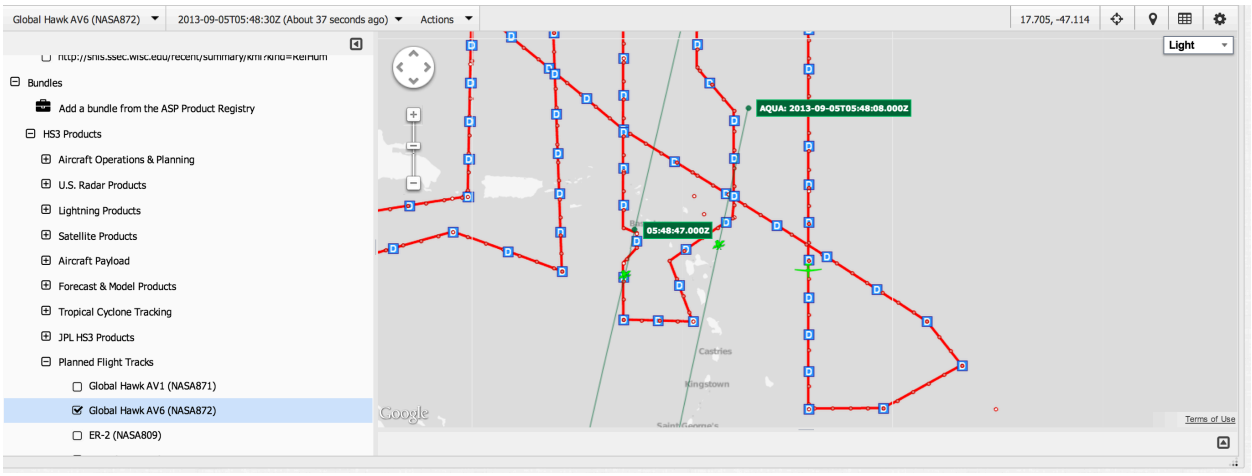

Figure 4: NPP and AQUA overpass over TS Gabrielle. The overpasses were roughly 285 (NPP) and 150 (AQUA) nautical miles west of AV-6 at the time of the satellite overpasses.

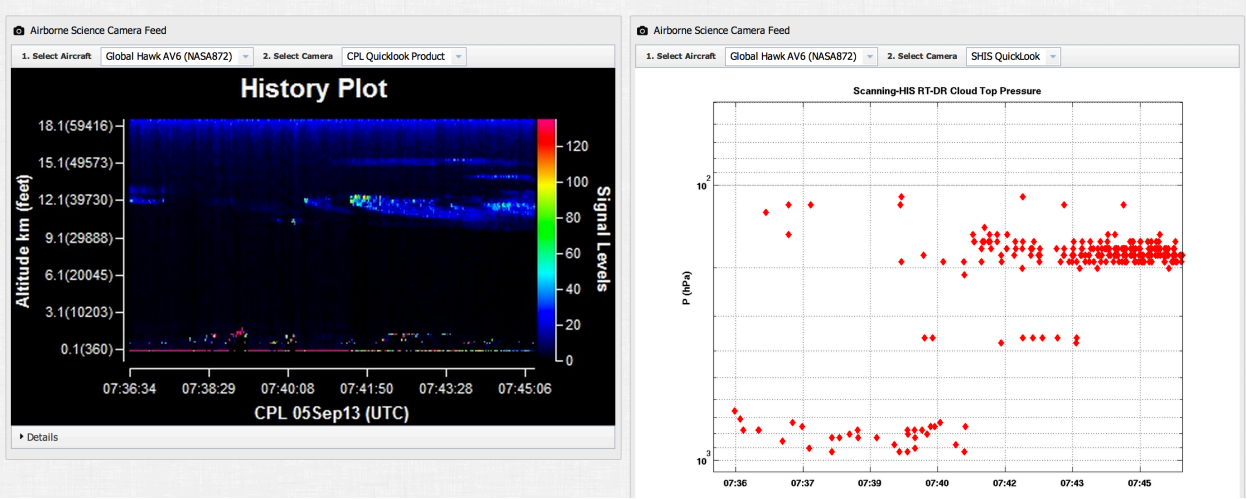

Figure 5: Comparison of CPL and S-HIS cloud top height products.

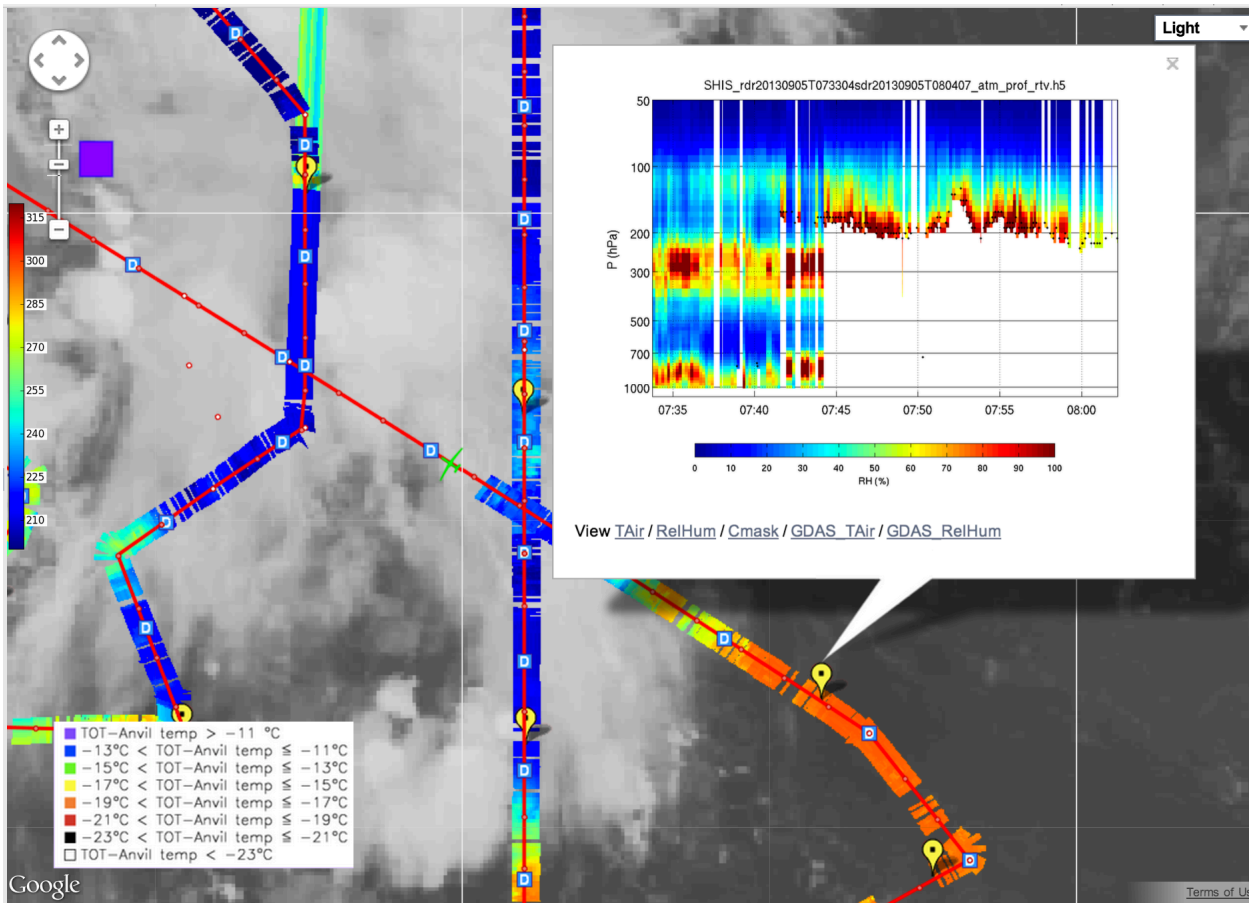

Figure 6: Corresponding 30 minute DR retrieval RH summary plot.