

**Aura Validation Experiment
Science Flight #5 Summary Report
November 7, 2004**

Flight Objective:

Provide: (1) Remote sensing observations for TES “step & stare” observational points in a latitudinal profile from north of the Yucatan peninsula to the US over the Gulf, and (2) Remote sensing observations for OMI scans of broken and scattered low level clouds. TES observational points are 5x8 km fields of view that are spaced every 31 km directly along planned flight track.

Flight Summary:

This flight was arranged to coincide with an Aura track segment that extended from Louisiana to the Yucatan Peninsula. Reaching the track segment enabled us to address validation objectives for each of the Aura instruments. The northbound track was along the suborbital track, the prime viewing areas for the TES and OMI nadir retrievals. This suborbital track of Aura in the Gulf of Mexico had both cloud-free and low broken and scattered cloud fields. These cloud patterns were primary objectives of the satellite intercomparisons.

The NASA WB-57F took off shortly after 11 am CST and landed at about 4:15 pm CST. The plane flew down to a point north of the Yucatan just above the tropopause at 52,000 feet. At this southern point, the plane turned northward and flew along the Aura suborbital track at 56,000 feet. The Aura overpass occurred at about 1:25 pm CST as the WB-57F approached the Louisiana coastline. The plane continued along this track for an additional 20 minutes and then turned eastward to do a spiral descent on an MLS profile location. Air traffic control only allowed the plane to descend to about 41,000 feet. The plane turned westward and overflew the Louisiana coastal region. Burning sugarcane fields were visually observed by the pilot, who then overflew the smoke plumes in this southern Louisiana region.

All of the WB-57F instruments operated and acquired data on the flight.

Weather information is available in Figures 2-4.

Flight Profile (see Figure 1)

Takeoff: 11:09 CST
Landing: 16:15 CST
Duration: 5.4 hrs

Point 3: 22°35'N, 88°57'W

Point 4: 26°49'N, 89°58'W

Point 5: 28°37'N, 90°26'W

Point 6: 30°25'N, 90°54'W

Point 7: 29°40'N, 89°05'W

Aircrew: Scott Reagan, Pilot, and Dom Del Rosso, Backseater

WB-57 Flight of 2004-11-07

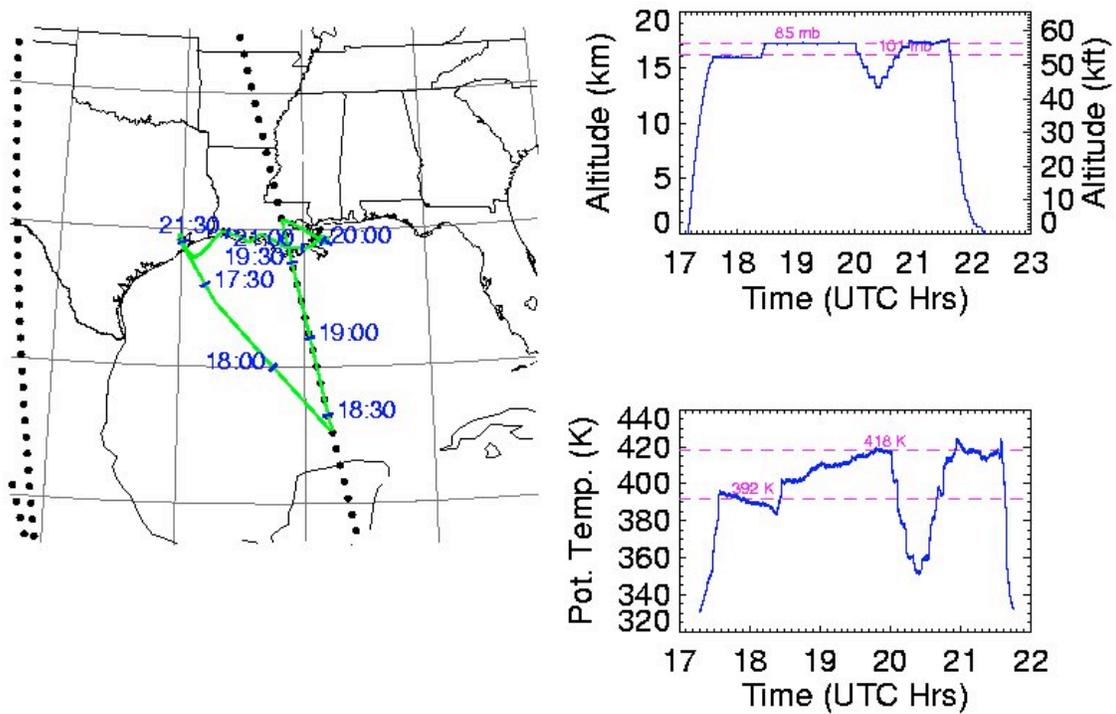


Figure 1 – Flight Profile

(Left) Map of WB-57F flight track (in green) with every half-hour marked. Aura nadir (faint cyan points) and MLS tracks (magenta points) are indicated.
(Upper Right) Plot of pressure altitude vs. time with the principal pressure levels of the flight marked.
(Lower Right) Plot of potential temperature vs. time with the principal theta levels of the flight marked.

18 UTC on 7 November, 2004 at -90.7 Longitude

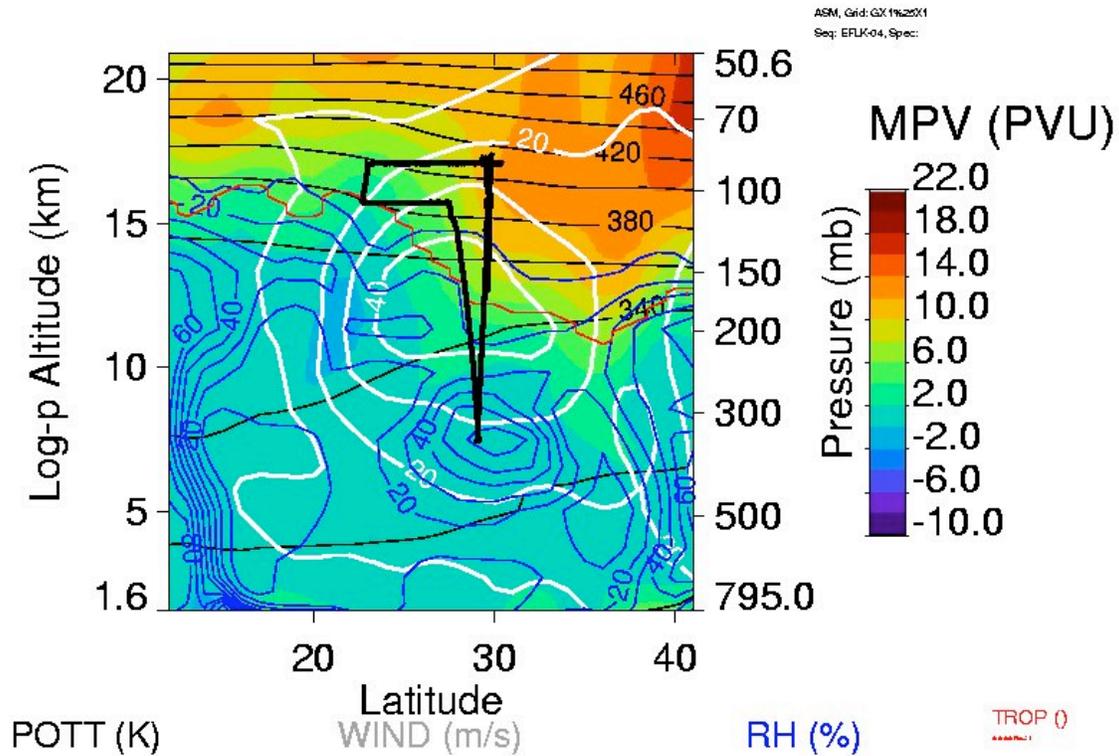


Figure 3 – Latitude Height Cross Section

Latitude-pressure cross-section of meteorological fields during the flight. The colored image represents modified potential vorticity (MPV); also shown are potential temperature (POTT) (thin black lines), wind speed (WIND) (white lines), relative humidity (RH) (blue lines), and the PV tropopause (TROP) (red line). The thick black lines mark the aircraft position and the vertical lines mark the positions of nearby MLS profiles.

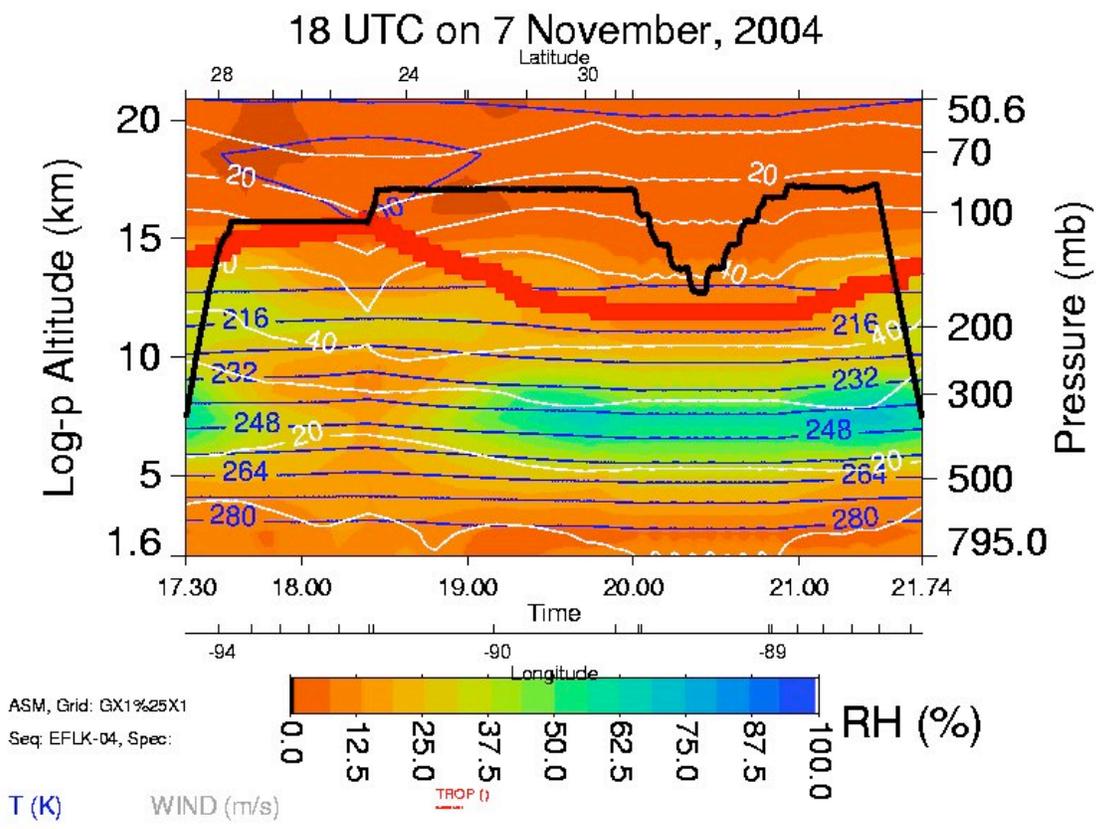


Figure 4 – Curtain Plot

Time-pressure "curtain" plot of meteorological vertical profiles along the flight track. The colored image represents relative humidity; also shown are temperature (T) (blue lines), wind speed (WIND) (white lines), and the PV tropopause (TROP) (red line). The thick black lines mark the aircraft position and the vertical lines mark the positions of nearby MLS profiles.