MITTS (2016) Project Manager Report

PI: McFadden (NOAA Cost Recovery)

Monitoring the Intensity and Track of Tropical Storms (MITTS) was a cost recovery project for NOAA flown by the NSF/NCAR G-V while the NOAA G-IV was undergoing repairs. It consisted of one combination test/ferry flight and three research flights over the eastern Pacific on 30 August - 2 September 2016. MITTS contained a small payload consisting of the AVAPS system and standard RAF instrumentation for flight level measurements including temperature, pressure, relative humidity, wind, and position.

Moisture in a radome data collection computer and problems with the data system caused many measurements to be missing during RF02 and RF03 (including research temperatures and winds). Observations from this flight should be used with caution.

Position and Altitude Data
GPS altitude and position measurements are named with a GG prefix. These are more accurate than the same measurements from the INS or avionics.

Temperature
The research temperatures (ATH1 and ATH2) come from a heated probe. Both tracked well during the entire project. When these are missing the avionics temperatures, AT_A or AT_A2, can be used.

Pressure
Static pressure (PSF) on the GV is measured using a static port on the fuselage and then corrected (PSFC) using the angle of attack and dynamic pressure. There are two measurements for dynamic pressure: a heated pitot tube on the fuselage (QCF) and the forward hole on the radome (QCR), which is unheated. Both are also then corrected (QCFC and QCRC) using the static pressure and angle of attack.

Relative Humidity
Humidity is measured by two collocated thermoelectric dew point sensors. The chilled mirror dewpoint sensors (_DPL, _DPR) typically perform poorly in flight profiles with many altitude changes as they flood on descent and take time to restabilize. However, this project was flown at a near-constant altitude so the data are much better than usual. There are also non-physical oscillations that occur occasionally in the chilled mirror sensors.

Winds
Three dimensional winds are derived using differential pressure measurements from the radome. Corrected horizontal (WSC, WDC) and vertical (WIC) winds are not available on RF02 and RF03, but INS derived winds can be used.