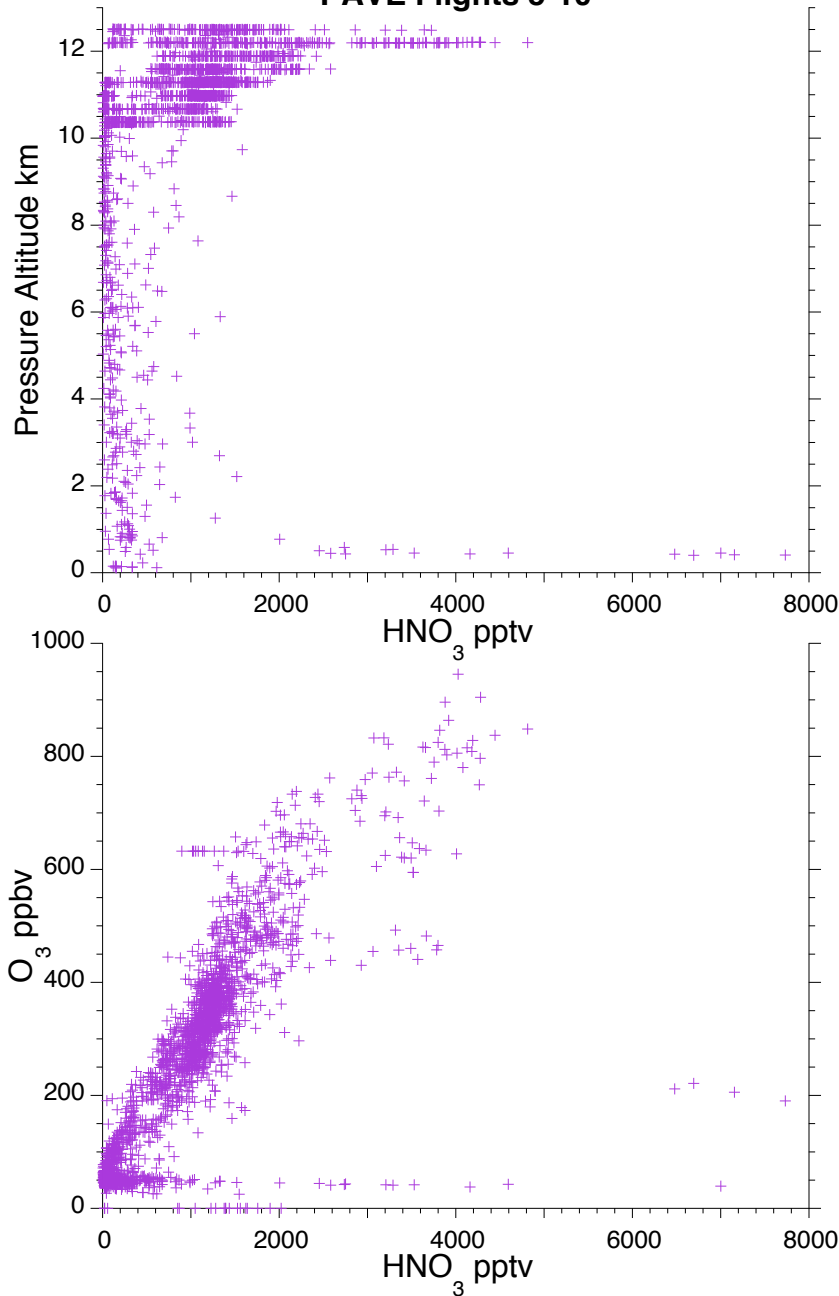


# Comparison of UNH In-Situ HNO<sub>3</sub> During PAVE to MLS Retrievals at 215 hPa

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Eric Scheuer  
Michelle Santee  
and the MLS Team

### PAVE Flights 5-10



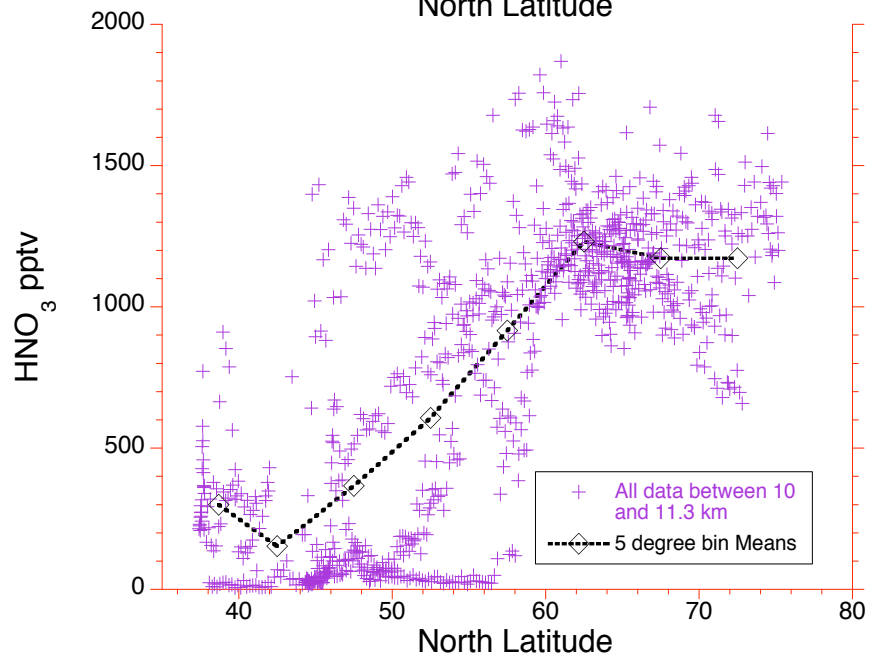
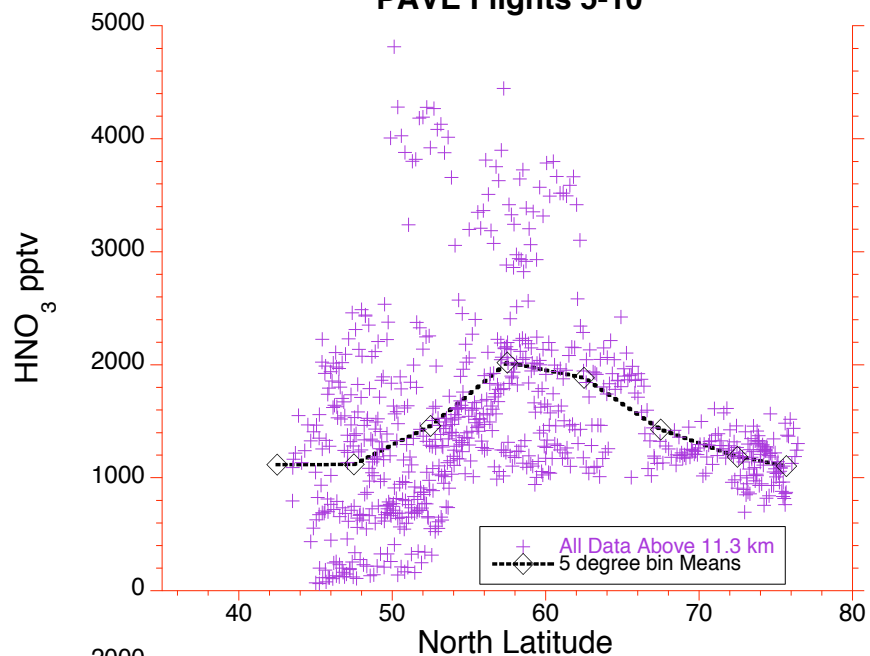
UNH SAGA makes insitu measurements of HNO<sub>3</sub> with mist chamber samplers and near-real-time ion chromatographic analysis.

For PAVE resolution was approx. 100 seconds. Nearly 3100 samples from the 11 flights, just over 2000 of these from the 5 flights out of Pease between 27 Jan and 7 Feb 2005.

Flight plans clearly emphasized UT/LS, usually at the ceiling of the DC-8.

Correlations with O<sub>3</sub> at large and fine scales provide confidence in the measurements. Structure in the UT/LS distributions of these tracers also of intrinsic interest (e.g., Melody Avery's talk earlier this week).

### PAVE Flights 5-10



Primary (sole?) purpose today is to compare SAGA insitu HNO<sub>3</sub> to the HNO<sub>3</sub> retrievals at 215 hPa by MLS.

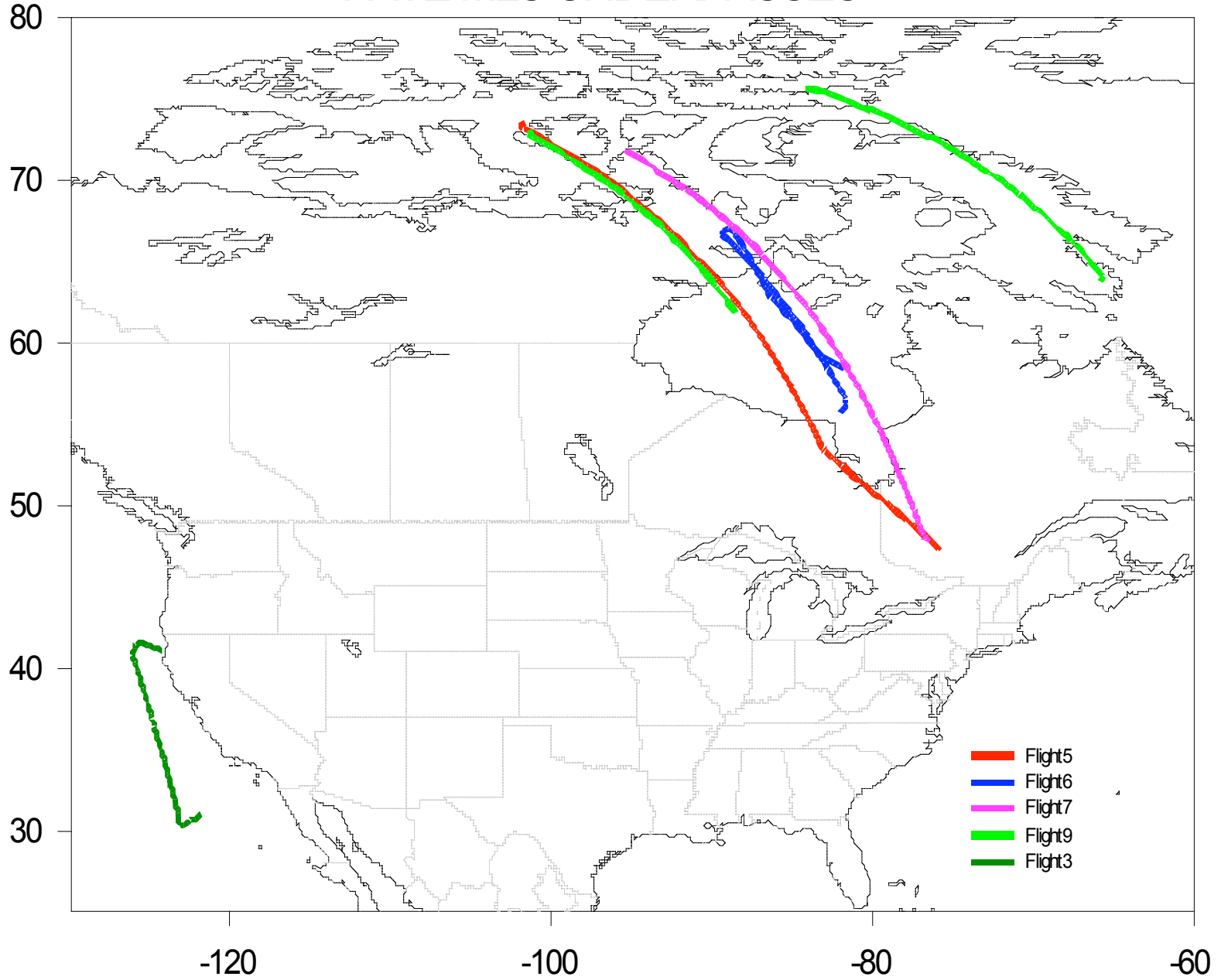
Note that MLS does “not recommend the retrievals at 215 hPa for scientific use” at this point.

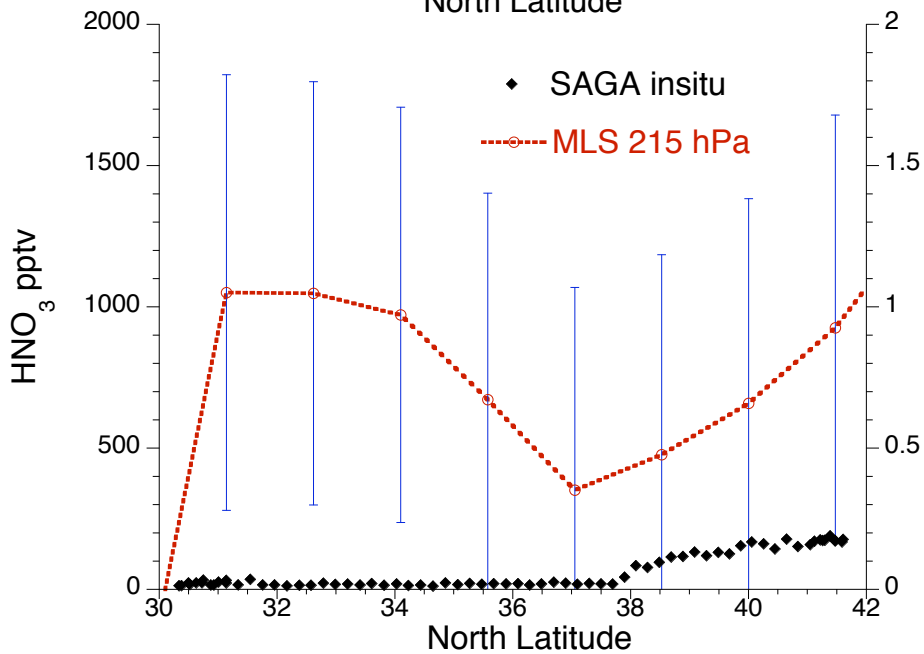
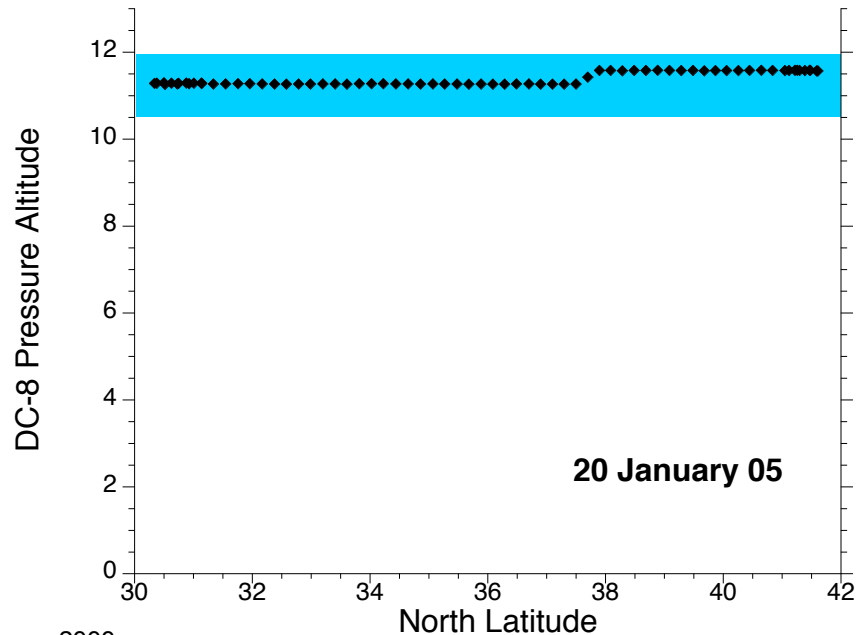
Do not let anything in the following impact your confidence in the MLS HNO<sub>3</sub> retrievals between 147 and 3.2 hPa!

Pressure altitude of 11.3 km is approximately at 215 hPa, these plots show all SAGA data on the Pease flights from this level upward about 2 km (top panel), and downward 1.3 km (bottom panel).



# PAVE MLS UNDERPASSES





This intercomparison leg was at the lowest latitudes, and further west (off CA), than any of the others that follow.

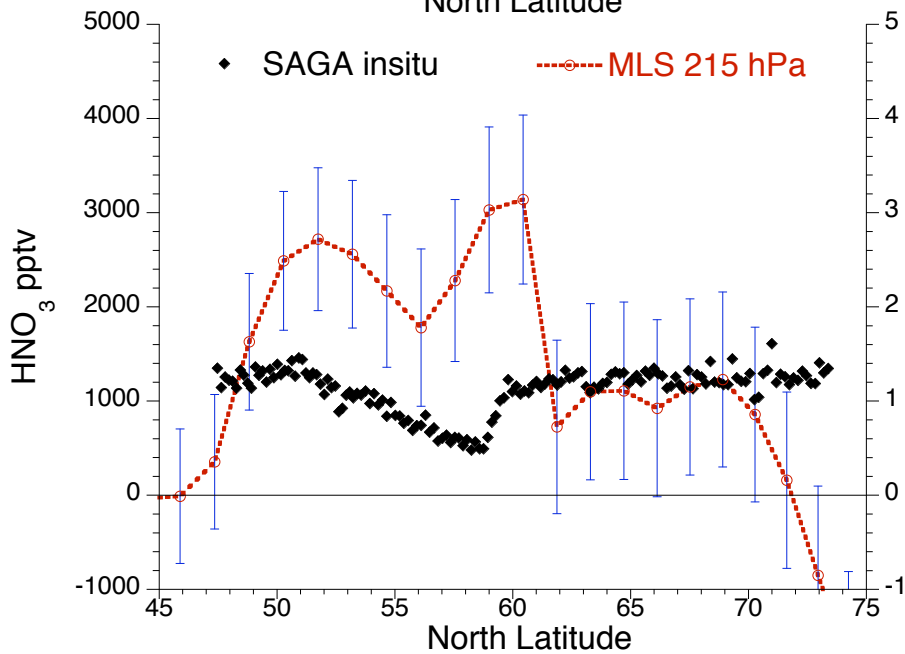
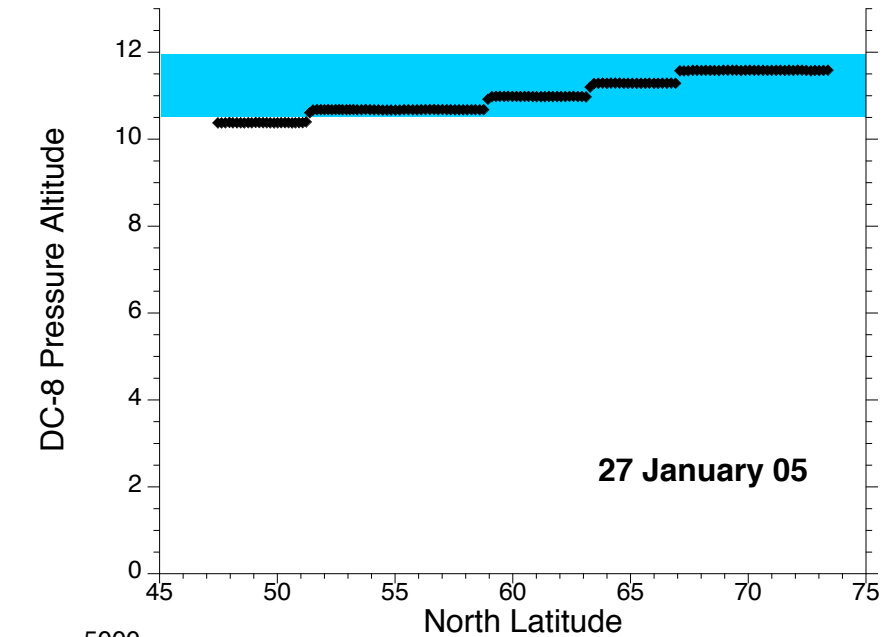
Times depicted in the plots.

DC-8 20:33 to 22:30

Aura 21:29 to 21:39

Overlaps in horizontal, vertical, and temporal space all very good.

Both platforms passed S to N on this, and all but one, of the intercomparison legs that will be shown.



North out of Portsmouth, into the vortex.

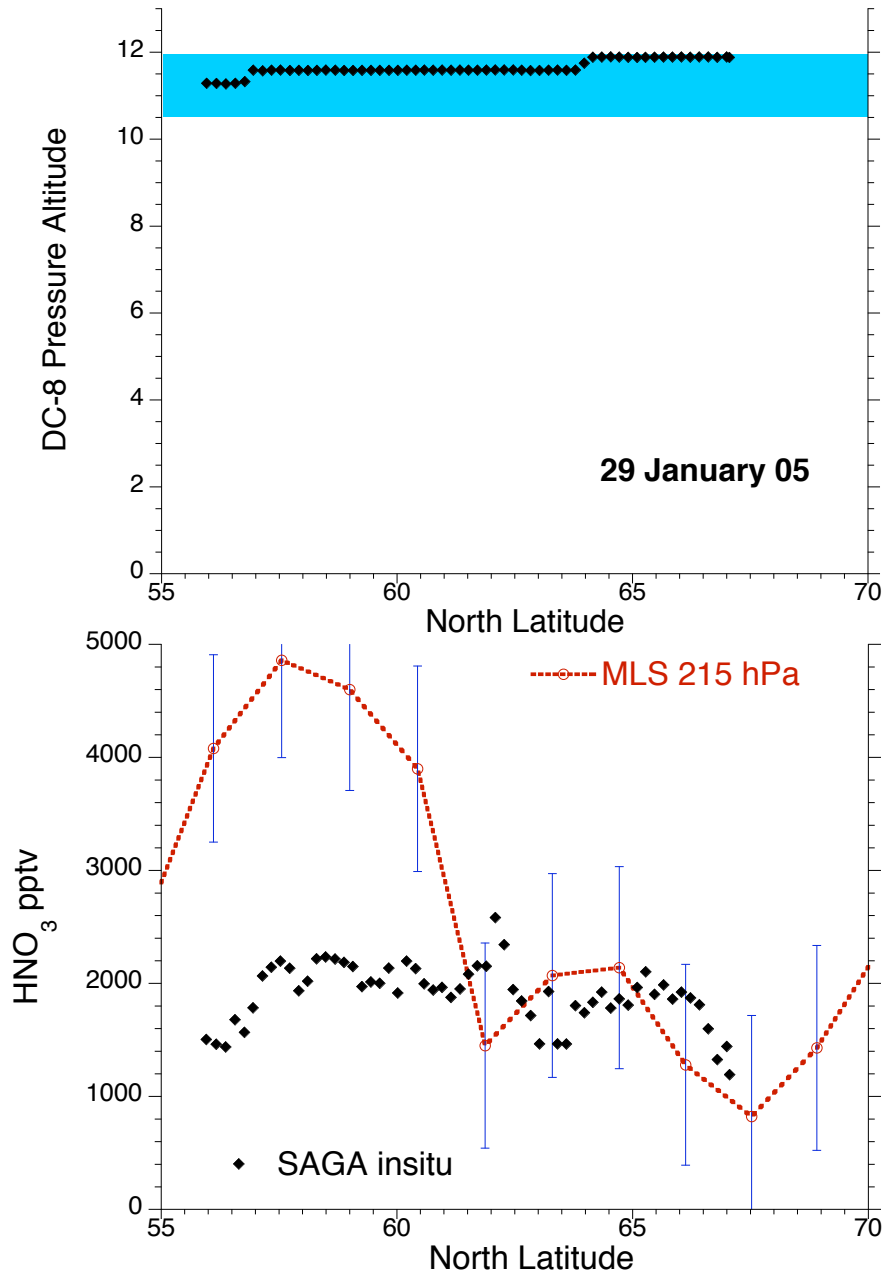
Coincident ground track from 49 to 73° North.

Times:

DC-8 15:30 to 19:43

Aura 18:27 to 18:35

Encouraging??

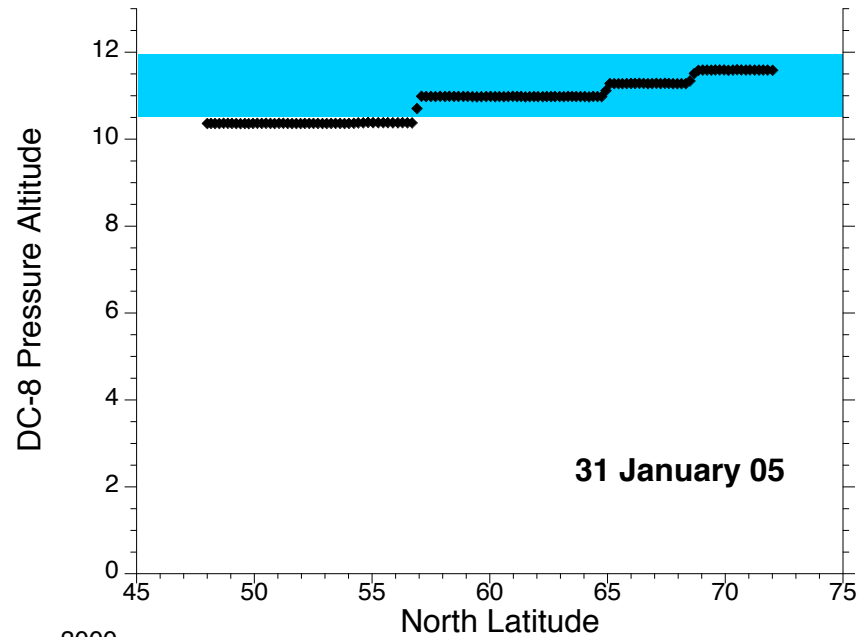


From this plot on, SAGA data are only shown for the correlative portion of the DC-8 flight track (56 - 68°N in this case).

Times:

DC-8 18:02 to 19:42

Aura 18:17 to 18:21



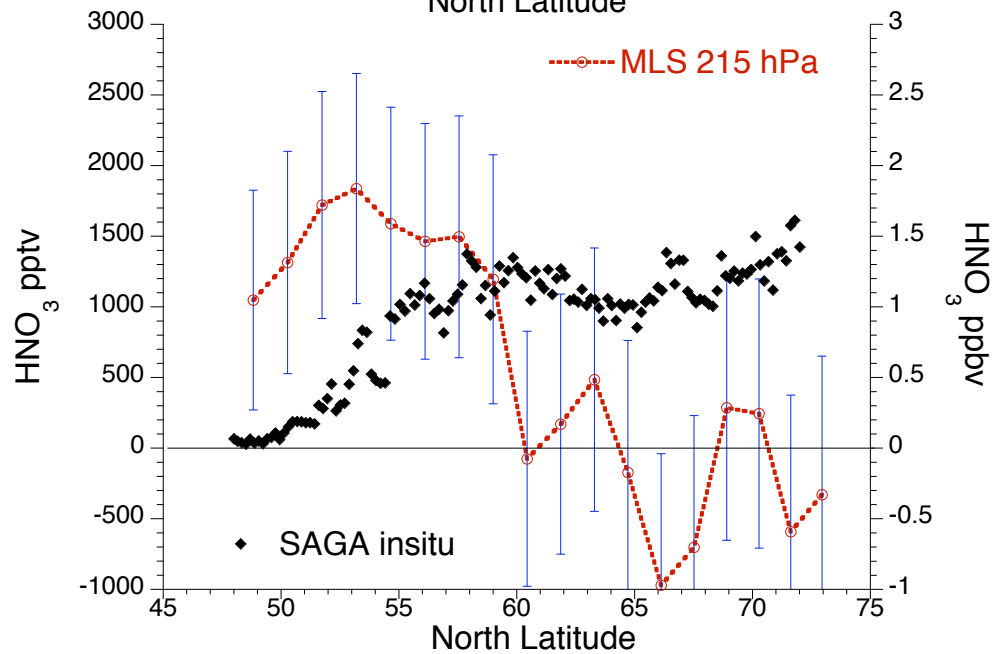
Overlapping ground tracks 48 to 72°N.

Times:

DC-8 14:19 to 17:56

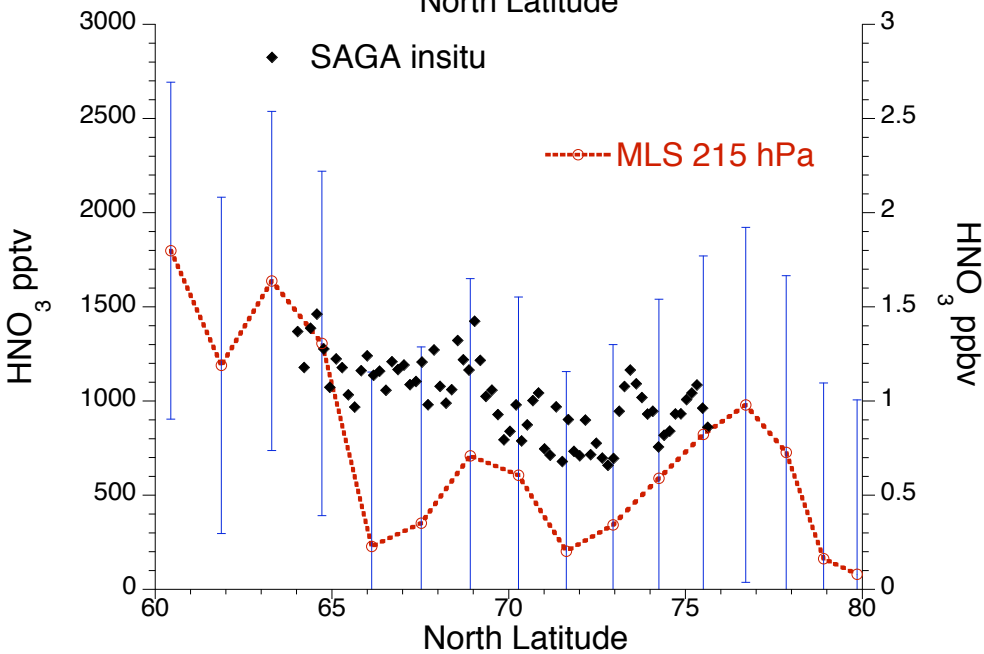
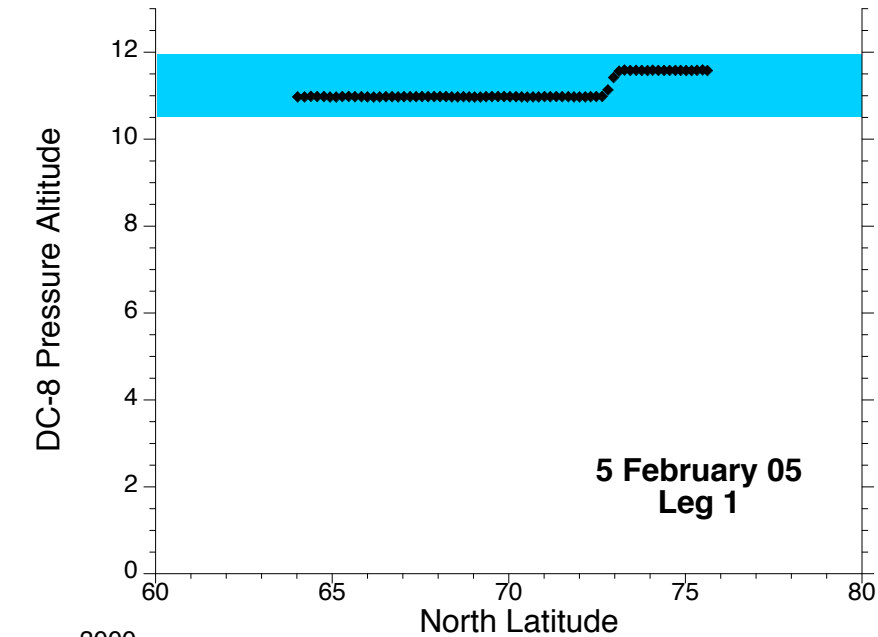
Aura 18:03 to 18:10

(DC-8 was early or Aura late, this is the only case with no temporal overlap.)



HNO<sub>3</sub> ppbv





DC-8 flew under Aura for two successive orbits on this flight.

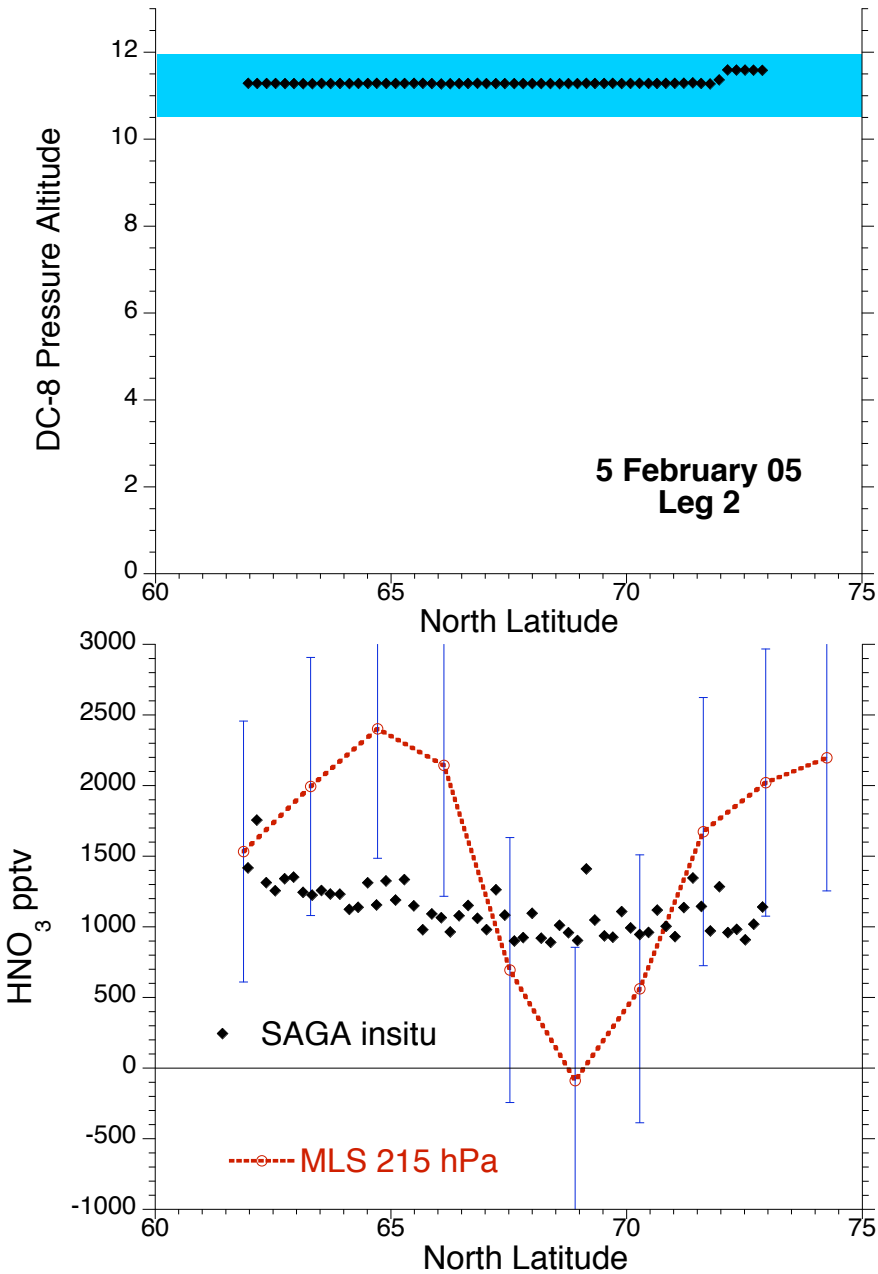
Plane was northbound on this leg, overlap 64 to 76°N.

Times:

DC-8 15:24 to 17:22

Aura 16:46 to 16:52

Agree within precision both legs.



DC-8 heading south this leg,  
 Aura passing S to N.

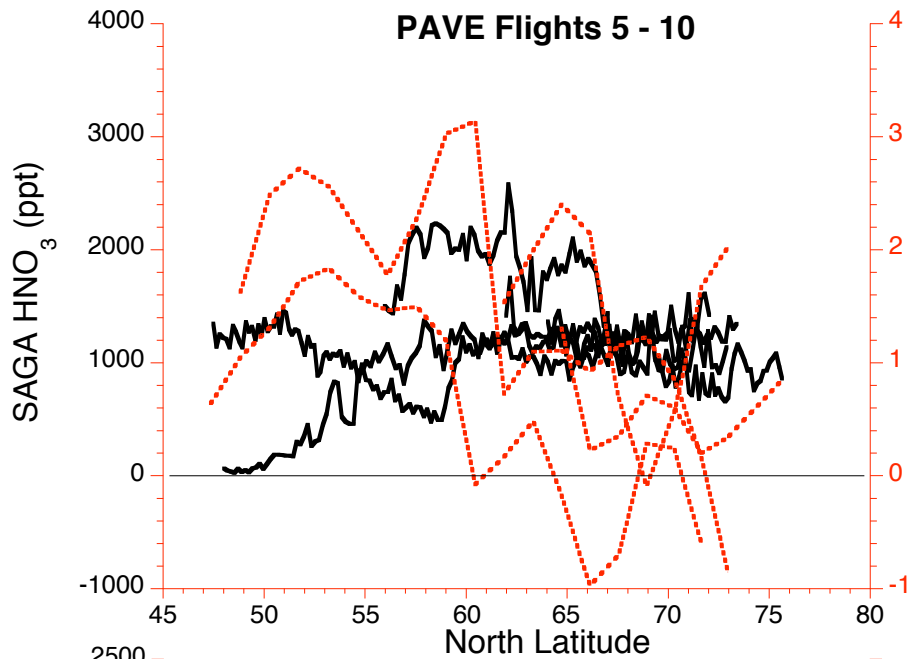
Overlap 73 to 62° N.

Times:

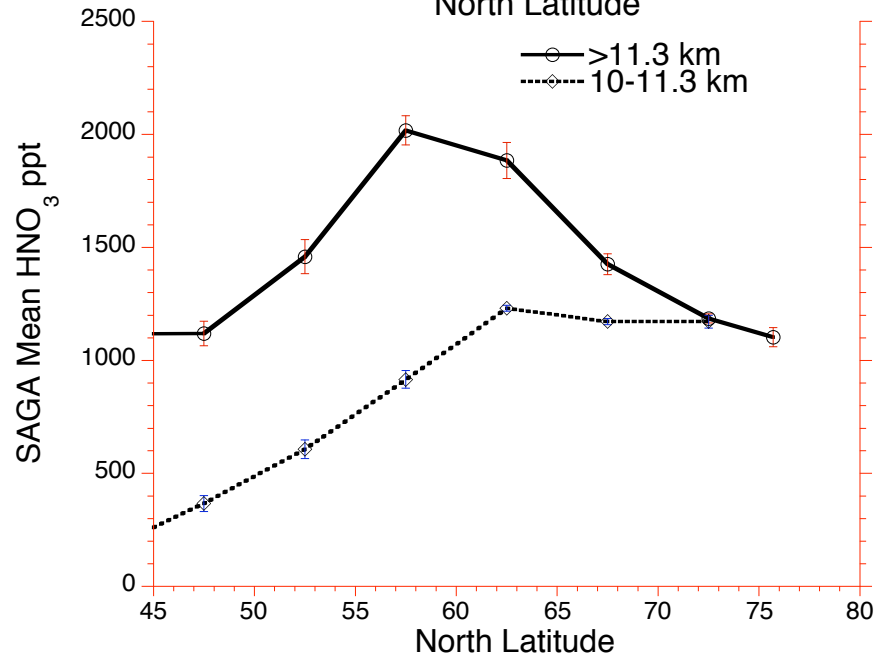
DC-8 18:06 to 19:42

Aura 18:24 to 18:29

Note that there is some similarity  
 between N and S bound legs in  
 the insitu data (lower further N.  
 at roughly 1 ppb, near 1.5 ppb at  
 S end).



Does stacking all the legs suggest better agreement??



Are the legs under MLS somehow anomalous in the SAGA data set over Canada?