File of comments about data quality for Certified LIMS
Version 6 (V6) Level 2 Data.

By Ellis Remsberg

DAYS SELECTED FOR DETAILED ALGORITHM TESTING

Day 1979 01 13-Significant zonal mean T difference in NH higher latitudes over 2 days (13-11, there were no data taken on day 12), due to changing atmospheric structure. There are PSC remnants at 30 mb in water and at 10 mb in NO2.

Day 1979 01 22-This day represents a stringent test of the pressure registration and temperature retrieval algorithm. Further, it has been difficult to attain accurate retrievals of water vapor and NO2 in the mid to lower stratosphere near the winter pole, where the temperatures are cold (and S/N low), primarily because there is a mismatch between the vertical FOVs for the temperature (CO2 channels) and these species (wide FOV) channels. The FOVs for the ozone and HNO3 channels are much more similar to that of CO2 and their profiles have better quality. Still the results for day 022 look good for all parameters.

Day 1979 05 05-Results for May 5 are good.

Day 1978 11 08-The zonal mean plot, h2o_std_asc.gif, for November 8 does not look right at high NH latitudes of the middle troposphere. Such low values are subject to large errors, are not based on good sampling, and should not be trusted. Also the minimum values of tropical water below
about the 40-mb level (here and on most other LIMS days) are based on just a very few scans; thus those values have large uncertainties and are not representative of the zonal mean. NO2 is not representative at those levels of the tropics either. Ozone and HNO3 are not zonally
representative at about the 70-mb level and below in the tropics.

_____
Note that the PSC template for Version (V5) is in Table 6 of the NASA Technical Paper 2625 by Remsberg et al. [1986], Description of Data on the Nimbus 7 LIMS Map Archive Tape: Ozone and Nitric Acid, December, 1986.
_____

OCTOBER 1978

1978 10 25-LIMS was off for several orbits on this day (at beginning of mission).

1978 10 26-Excess water at 20 mb, 60S? LIMS did not take data for 3 orbits.

1978 10 27-Excess nitric acid and ozone at 40S, 70 mb over Pacific region. LIMS was off for two orbits on this day. A number of NO2 scan segments exceed our upper limit threshold and have been removed.

1978 10 28-Quite a few scans were screened out for descending orbits by the RAT analysis procedure, but not for the ascending orbits. Was ERB scanner operating at this time causing excess jitter?

1978 10 29-LIMS off for one orbit on this day. Large V6 minus V5 T(p) difference in upper stratosphere near 60N.

1978 10 30-Geopotential shows wave 2 at 70 mb at NH high latitudes, but temperature does not (even at 30 mb). Was also present in geopotential at 70 mb for Oct 28 and 29. Wave 2 is not present on the following day, October 31. May indicate a problem with continuity of the daily 50 mb base heights from NMC.

1978 10 31-Data are OK.

NOVEMBER, 1978

1978 11 01-A lot of HNO3 profiles were screened out in the upper stratosphere for orbit 107. Was ERB scanning on that orbit?

1978 11 02-A number of NO2 profiles exceed the threshold mixing ratio for orbits 121 and 122. Jitter effect?

1978 11 03-Plots look OK.

1978 11 04-Data look good.

1978 11 05-Data are OK on this day.

1978 11 06-Plots show no significant anomalies.

1978 11 07-On orbit 203 there were a lot of water and NO2 scans that exceeded their m.r. threshold at top of scan.

1978 11 08-Data are OK.

1978 11 09-Data look good.

1978 11 10-Data plots look reasonable.

1978 11 11-LIMS data look good.

1978 11 12-Ozone is high over Africa at 70 mb, possibly evidence of contamination by thin clouds. There is excessive HNO3 and ozone near 32N, 80 mb, in the zonal mean plots.

1978 11 13-There is excess HNO3 and ozone at 70 mb in one sector at 55S. On the listing of NO2 scans removed, one scan had a value of 1 X 10(+24); should this have been written out?

1978 11 14-Data are OK.

1978 11 15-The high value of asc NO2 in the NH polar region at 10 mb may be an artifact.

1978 11 16-Data look good.

1978 11 17-This was the first significant day of operations for the ERB scanner. Quite a few desc. scans were tossed out, especially for the NH. Water and NO2 was flagged for exceeding their max. m.r. on orbits 333 and 334. There is a bad ozone data point at 60S near 70 mb, but it does not seem to perturb the 70 mb polar plot.

1978 11 18-There is a region of low water over the N. Pacific at 3 mb and 10 mb. May be due to a faulty interpolation in zonal direction for the polar plots. Note that the asc orbit and many descending scans are missing in NH over the N. Pacific.

1978 11 19-Data are good.

1978 11 20-Lots of descending scans were thrown out at RAT processing level.

1978 11 21-Quite a few descending NO2 scans did not process successfully. There is an increase in desc NO2 at 0.2

mb near the NH Pole-evidence of mesospheric source of NO2 or an artifact?

1978 11 22-There is a loss of some descending scans. Otherwise the data are OK.

1978 11 23-There is a high value of ascending HNO3 near 15S and 50 mb.

1978 11 24-The NH polar vortex is cold enough for PSC formation at 30 mb.

1978 11 25-LIMS was off for this day.

1978 11 26-There is a significant increase in the number of scans where the PSC flag was triggered. First indication of PSCs for this late autumn season. The 180 K contour shows up at 0.01 mb at high SH latitudes.

1978 11 27-There is a PSC remnant in descending NO2 over Iceland at 30 mb, just where temperatures are coldest. PSC flag was tripped near 70 to 80 mb at about 60N, 330E. Some water scans exceeded 12 ppmv near 350 E and 20 mb. There are high values of NO2 at 0.15 mb, 80N.

1978 11 28-LIMS was off for 4 orbits. There is a PSC remnant in water at 30 mb.

1978 11 29-There is PSC contamination in NO2 at 30 mb in NH polar region. There is one point of high, spurious HNO3 at 70 mb over the tropical Pacific.

1978 11 30-There are PSC remnants in NO2 at 30 mb.

DECEMBER 1978

1978 12 01-Descending NO2 data over N. Atlantic (in one orbital
segment) are suspect at 3 mb and 10 mb. Water is also affected there. Ozone and HNO3 look OK. There is a bad H2O point near 55N at 70 mb in the zonal mean. There is a PSC remnant in NO2 at 30 mb.

1978 12 02-There is a PSC remnant in NO2 at 30 mb.

1978 12 03-There is high water at 70 mb off the E. coast of Asia. There is a PSC remnant in NO2 at 30 mb. There is a number of high NH NO2 values for orbit 562. Mesospheric NO2 shows up clearly.

1978 12 04-Several orbital segments have no data in NH. There are no PSCs indicated for this day, consistent with findings from V5.

1978 12 05-There is a PSC remnant in desc. NO2 at 10 mb. There are quite a few desc. NO2 scans that exceed the max m. r. threshold. There is evidence for PMCs in SH ozone.

1978 12 06-There are high values of NO2 in one equatorial sector at 30 mb-cloud influence? There is excess ozone and HNO3 in one
sector near 60S at 70 mb. There are quite a few NO2 scan segments that exceed the max m.r. limit in the NH polar region.

1978 12 07-LIMS was turned off this day.

1978 12 08-LIMS was off for one orbit. Otherwise the data look OK.

1978 12 09-A number of NO2 scans exceeded the max m. r. criterion. There is excess water at 1.5 mb near 30N in the zonal mean plot. Perhaps it is affected by the assumed water above top-of-profile.

1978 12 10-The data are good.

1978 12 11-Some PSC remnants in NO2 at 10 mb. Quite a few NO2 scans exceed the max m.r. in the upper stratosphere at NH high latitudes.

1978 12 12-Data look OK.

1978 12 13-There is a region of high water at 70 mb in central Asia. Quite a few asc. NO2 scans exceed the max m.r. for NO2 at high NH latitudes.

1978 12 14-The data are OK.

1978 12 15-Data look good.

1978 12 16-The data are OK.

1978 12 17-No anomalies to report.

1978 12 18-The data look good.

1978 12 19-LIMS was off for this day.

1978 12 20-No data for 1 orbit. There is very high asc. NO2 at one location at 1 mb in SH.

1978 12 21-LIMS was operating for only half of the orbits.

1978 12 22-One half orbit of data missing.

1978 12 23-There is excess water at 70 mb at high NH latitudes.
There is excess NO2 at 10 mb over the NH east Atlantic.

1978 12 24-LIMS took data for only one-half of the orbits.

1978 12 25-There is a PSC remnant in H2O and NO2 at 30 mb. This is the first day for the reappearance of PSCs in the vortex. LIMS was off for one and one-half orbits. There is elevated HNO3 at 3 mb in NH polar region.

1978 12 26-There are low values of desc. NO2 at the NH Pole at 1 mb.

1978 12 27-There is a PSC remnant in NO2 and H2O fields at 30 mb, but not for HNO3 or ozone. Looks like ERB scanner was on during nighttime (desc) periods for this day.

1978 12 28-There is a PSC remnant in NO2 at 30 mb. There is loss of some desc. scans on this day. There is excess water near 50 mb and 45S in the zonal mean plot.

1978 12 29-LIMS was turned off for this day.

1978 12 30-There is a PSC remnant in water and NO2 at 30 mb.

1978 12 31-LIMS was turned off for this day.

JANUARY 1979

Day 1979 01 01-PSC remnant in water at 30 mb. Evidence of loss of NO2 in upper polar stratosphere region, where HNO3 has increased. Asc NO2 polar plot shows collar of minimum values at 10 mb near polar night that was not detectable in V5.

Day 1979 01 02-Increase in polar NO2 at 1 mb. PSC remnants in water and ozone at 30 mb and in NO2 at 10 mb.

Day 1979 01 03-SH temperature is less than 180K at 0.01 mb (polar summer mesosphere). PSC remnant in NO2 at 10 mb. High NO2 at 1 mb in NH vortex region.

Day 1979 01 04-There is a 5 to 10% asc/desc asymmetry in zonal mean ozone at mid to high latitudes of the lower stratosphere-related to sampling or PSC interference (and removal) effects? Significant temperature difference at high NH latitudes (day 4-3 zonal mean plot). PSC remnants at 30 mb in water and NO2. A number of scan segments of NO2 were screened out of the lower polar stratosphere.

Day 1979 01 05-Large asc/desc difference in ozone at 0.2 mb and 36N-apparently unrelated to temp tide, but maybe a gravity resolution or zonal sampling issue. No PSC features are present in water, but do remain in asc NO2 at 30 mb.

Day 1979 01 06-No PSCs indicated for this day.

Day 1979 01 07-There is spurious water at 70 mb, 55N over Siberia.

Day 1979 01 08-Nighttime NO2 is low in NH polar mid to upper
stratosphere, but likely real. There are PSC remnants in water, ozone and NO2 at 30 mb.

Day 1979 01 09-PSC remnants at 30 mb in water, ozone, and NO2 and in NO2 at 10 mb. May need to screen for them further when creating the mapped fields.

Day 1979 01 10-PSC remnants at 30 mb in water, nitric acid, ozone and NO2; and at 10 mb in NO2.

Day 1979 01 11-PSC remnants in water and NO2 at 30 mb.

Day 1979 01 12-LIMS did not make measurements for this day.

Day 1979 01 13-Region of PSCs no longer extends to 340E as opposed to what was indicated from the template derived from the V5 fields.

Day 1979 01 14-PSC remnant at about 270E, 30 mb in water. There are no PSC features at 340E.

Day 1979 01 15-PSC remnant at 270E, 30 mb in water and NO2. There is a spurious feature in the ozone field at 70 mb over S. Australia.

Day 1979 01 16-There are high values of desc node NO2 in the SH
mesosphere. There are PSC remnants in 30 mb and 70 mb plots of water.

Day 1979 01 17-There are PSC remnants in water and NO2. There
seems to be spurious HNO3 in the SH Pacific region.

Day 1979 01 18-PSC remnant at 30 mb, 40E in water, ozone, and NO2. There is elevated polar NO2 at 1 mb.

Day 1979 01 19-The temperature field shows large changes in the NH polar mesosphere (day 19-18 zonal mean plot)

that are not due to sampling; most likely real. A double stratopause is showing up. There is excess water at 70 mb near NH pole, in NO2 at 10 mb, and in ozone at 30 mb. Vortex is showing signs of distortion on this day. The zonal mean asc-desc difference plots for ozone and T are reversed for the V5 images.

Day 1979 01 20-There is elevated water and NO2 at 10 mb and 30 mb at edges of vortex, perhaps an indication of descent. There is spurious water at 70 mb near 60S, 200E.

Day 1979 01 21-There is spurious water near 50N (see asc plot showing more than 10 ppmv at 70E, 70 mb). There is also excess water and NO2 at 10 mb near 90E and in NO2 at 45N, 45E. It is obvious that the retrievals are not so accurate in this region. The PSC file for this day indicates there are several ozone profiles that are erratic (noisy) and have m.r. less than 0.2 ppmv in this same region from 13 to 32 mb. Tangent layer S/N is low. A mapped product should provide better horizontal
continuity through this region. Note that it is expected that PSC contamination ought to be occurring near 355E, where the vortex T is coldest. Still the V6 results for this day are of better quality that those of V5.

Day 1979 01 22-There is excess NH water and NO2 from 90E to 130E at 10 mb and 30 mb. Features occur just outside the vortex region, not in the cold temperature region. No data were taken for several orbits on this day, and this situation leads to larger N-(N-1) day differences in temperature and species.

Day 1979 01 23-There are large changes in polar temperature from day 22 to 23. Several scans that were flagged for PSCs do not occur in the cold vortex region. Such features ought to be cleaned up when the mapped product is created.

Day 1979 01 24-There is elevated polar water at 10 mb, but no PSC signatures are indicated.

Day 1979 01 25-There are significant zonal asc/desc T differences in the lower stratosphere at high latitudes. This seems to be due to a missing asc orbital segment which caused a warm pocket over the Aleutians to not be sampled. No orbital segments are missing for the SH.

Day 1979 01 26-The zonal mean temperature shows evidence of decay of the warming in the NH upper stratosphere. The vortex has also been shifted off the Pole throughout the stratosphere. The NH polar plot of water for 3 mb is nearly uniform even in the high latitude regions, where there are large variations in temperature and geopotential height. This result is an excellent indication that the T(p) retrieval and radiance profile registration are very accurate and that the effects of horizontal temperature gradients are being handled well. At 10 mb one can see evidence of slightly elevated water in the vortex itself. A tongue of low nitric acid shows up clearly in the 10 mb polar plot. The high latitude nitric acid at 3 mb has begun to dissipate. These are classic LIMS results!

Day 1979 01 27-The V6 minus V5 differences for zonal mean ozone in the mesosphere at NH mid latitudes are due to the fact that only half of the scans for this day seem to have been processed for V5! V6 is not missing those data.

Day 1979 01 28-There is a striking V6 minus V5 result for ozone in the NH lower mesosphere on this day. There is also a large change from day 27 to 28 in NH high latitude V6 temperature, indicating transport and/or radiative relaxation associated with the SSW. There is excess water at 70 mb over the N. Atlantic in a region of cold temperature-maybe a PSC feature at 50 mb? Note that the temperature at 30 mb is about 196K and possibly colder at 50 mb.

Day 1979 01 29-There is an apparent discontinuity in the zonal mean plots of V6 minus V5 NO2 near 1 mb and 40N that seems to be traceable to the V5 retrieval of water that was initiated at a higher altitude poleward of that latitude (this V5 feature is not unique to this January day). The meridional distributions of V6 NO2 show much better continuity because its algorithm treated water in a more uniform manner at profile top. There is apparent excess water at 70 mb over N. Atlantic (maybe a PSC, as on day 28). There is evidence of descent of polar NO2 to the 1-mb level. The 70 mb plot of SH nitric acid shows the pentagonal zonal wave structure very well.

Day 1979 01 30-The elevated polar NO2 extends to middle latitudes of the upper stratosphere at this time. There are

PSCs on this day in the vortex region of coldest temperatures; these features were not detected in V5.

Day 1979 01 31-The asc/desc differences in ozone at middle latitudes seem to have some significant day/night effects in the lower mesosphere that we suspect are due to non-LTE processes that contribute to the LIMS radiances near 9.6 micrometers. (These features show up on other days and in V5, too). They do not seem to be related to any inability to account for the effects of tides in the retrieved temperatures, since such tides occur at lower latitudes, too. There is spurious water at 70 mb over Finland and excess NO2 at 30 mb over N. Europe, most likely due to residual emission from PSC particles that was not flagged by our criteria for sensing them in the ozone channel. The mapping algorithm ought to dampen the water feature on the 70-mb map. There are elevated values of NO2 at 1 mb at high latitudes.

FEBRUARY 1979

1979 02 01-There are a number of instances where the RTO and DIF criteria for PSC flagging were triggered. These cases occur in a region of cold T at 30 mb. There is excess NO2 in the vortex at 30 mb. Several NO2 scans have m.r. that exceed 25 ppmv near 5 mb.

1979 02 02-PSCs indicated in vortex, where T at 30 mb is cold enough (so likely real). There is elevated NO2 over the Northern mid Atlantic Ocean region. Large A/D differences in mesospheric ozone at mid latitudes (a sampling mismatch?). There is a general problem of apparent excess NO2 across many latitudes at 30 mb and below, which applies throughout the LIMS V6 dataset. This apparent excess may be within the bias errors for NO2 at those altitudes and is being evaluated further.

1979 02 03-Excess H2O in vortex in 10, 30, and 70 mb polar plots; excess NO2 at 30 mb. There is elevated NO2 at 1 mb and HNO3 at 3 mb.

1979 02 04-Excess NH polar water at 10 to 30 mb and NO2 at 30 mb. Some ozone scan segments indicate PSCs near 60N, 90E and may be due to a strong vertical T gradient just above 10 to 20 mb that is not being accounted for accurately-a difficult circumstance.

1979 02 05-Excess NH polar water at 10-mb level and below, especially at 70 mb; excess NO2 at 20 mb. There is a large wave-1 character to the HNO3 and NO2 at 10 mb near the Pole.

1979 02 06-Excess water in polar regions at 10-mb level and below. There is significant descent of HNO3 in the polar region. The polar stratopause has dipped to 3 mb on this date.

1979 02 07-Excess water and NO2 near the Pole at the 10-mb level and below.

1979 02 08-A special correlative flight of the LIP balloon at Primrose Lake, Canada, was made on this day. There is excess water at 20 to 30 mb and at 70 mb. The asc/desc difference in ozone near 70N and 0.3 mb may represent a real variation of

ozone at the SS terminator. Local time of measurement at 80N is 14.7 hours for asc and 21.2 hours for desc. But there is also an opposing asc/desc T difference in that region, so may be due to a lack of coincident sampling for asc versus desc. The mapped results should provide a better picture.

1979 02 09-Excess water below 10-mb level. PSC remnants in NO2 at 30 mb.

1979 02 10-No LIMS measurements on February 10.

1979 02 11-Excess water in polar region. Temperature is changing rapidly in NH polar region.

1979 02 12-There is an indication of excess water at 20 to 30 mb and of NO2 at 30 mb.

1979 02 13-Excess water at 20 to 30 mb. LIMS was not taking data for one orbit on this day.

1979 02 14-There is excess water and HNO3 at high latitudes that seems to be traceable to PSC remnants.

1979 02 15-There are large asc/desc differences in T, HNO3 and ozone in the NH due to one-third of the orbits that are missing on this day.

1979 02 16-The data on this day were inadvertently missed in the processing of the V5 dataset, so all of these retrieved profiles are new for V6. There is excess water at 10 to 30 mb.

1979 02 17-LIMS made no measurements on this day.

1979 02 18-There is excess water at high NH latitudes. There is a definite asymmetry in NO2 at 30 mb for SH versus NH.

1979 02 19-There is excess water in the vortex at 30 mb. There is spurious water over the W. Pacific at 70 mb.

1979 02 20-The polar vortex is effectively split in two by this date.

1979 02 21-There are large (>15%) V6 minus V5 values for ozone at 1 mb in high NH latitudes.

1979 02 22-The zonal mean water has a maximum value of only 6 ppmv in the NH stratosphere.

1979 02 23-No anomalies found.

1979 02 24-There is excess water at 30 mb in the vortex.

1979 02 25-Excess water in vortex at 30 mb, but T seems to be too warm for PSCs. How much of this excess water is real? In this situation (very steep vertical gradient in temperature just above the tangent layer) the excess water is likely to be within the error budget for water. Studies will be done to confirm this possibility.

1979 02 26-Excess water and NO2 at 30 and 70 mb at high latitudes. Retrieval is having difficulty in the NH polar region near 70N, 40 to 90E, above which the vertical T gradient is very steep. There are a number of PSC flags that were triggered by our detection algorithm, but environmental conditions are not cold enough for PSCs. There is a bad scan segment at 50S, 70 mb. There is excess

NO2 at 1 mb.

1979 02 27-There is excess water and NO2 in the NH polar stratosphere at 30 mb and at 70 mb.

1979 02 28-The descent of HNO3 in the NH high latitudes is evident in the zonal mean plot. Vortex is reforming near the NH Pole by this date.

March 1979

1979 03 01-Only one orbit on this day, but data are OK.

1979 03 02-Starting on March 1, the v6-v5 plots of NO2 do not show the discontinuity at top of distribution at about 40N latitude. That feature occurred in January and February because of the modification to the pressure registration and the water vapor retrieval algorithms poleward of 40N in the V5 dataset for those months. Water vapor is the major source of daytime radiances in the NO2 channel at top of profile.

1979 03 03-Data look good.

1979 03 04-No anomalies to report.

1979 03 05-Data look good.

1979 03 06-NH polar region is defined by low NO2 at 30 mb. Polar region is warm at 30 mb. Data look good on this day.

1979 03 07-Zonal and polar plots look good.

1979 03 08---Data are OK for this day.

1979 03 09-Nighttime NO2 is still less that 12.5 ppbv in NH on this date. Data look good.

1979 03 10-The 1.5 ppmv HNO3 m.r. contour dips down to 250 mb poleward of 40N. There is a 10% A/D ozone difference at 1 mb, 70N. Vortex is centered off Pole over Greenland.

1979 03 11-Excess water in region of vortex at 30 mb.

1979 03 12-Data look good.

1979 03 13-There were no LIMS measurements on this day.

1979 03 14-LIMS was off for one orbit.

1979 03 15-Cloud effects extend into tropical lower stratosphere.

1979 03 16-See comment for day previous day.

1979 03 17-The A/D difference for water is noticeably hemispherically asymmetric, and may be related to an opposing difference in temperature.

1979 03 18-See comment for March 17. Is this related to an A/D difference in chemiluminescence from NO2?

1979 03 19-No data were taken on parts of several orbits on this day.

1979 03 20-For the V6-V5 zonal plot of T, the increase at 1.5 mb, 5S is due to V6 resolving more of the amplitude of the diurnal T tide.

1979 03 21-Excess water at 70 mb over Indonesia (also ozone).

1979 03 22-Data are OK.

1979 03 23-A spot of excess water at 70 mb, 60S near tip of S. America. Similar enhancement in HNO3 and ozone but at a different longitude (on the plots)!

1979 03 24-A/D water is negative by 5% in upper tropical stratosphere (rather than positive).

1979 03 25-There were no LIMS measurements on this day.

1979 03 26-The positive Asc/Desc difference in ozone centered at about 40S seems to be related to the time day of the respective measurements (1430 hours for day vs. 2130 hours for night at that latitude). Ozone has a daytime relative maximum in early afternoon, which may explain this nearly permanent feature of the LIMS dataset.

1979 03 27-The zonal mean plot of Asc ozone has a maximum in the upper tropical mesosphere. Is this a NLTE effect from CO2? Note however that descending ozone is also increasing in that region. Such increases may imply a bias in the assumed TOA for the temperature retrievals; that region is quite cold.

Based on the orbit tracks on the polar plots, it seems that the last orbit for March 26 is included in the data for March 27.

1979 03 28-Data are OK.

1979 03 29-Large negative A/D difference in water at high NH latitudes.

1979 03 30-Data look good.

1979 03 31-Data look OK.

April 1979

1979 04 01-Data look good.

1979 04 02-The negative asc/desc difference in H2O occurs just where the day/night terminator (and the big change in NO2) exists. NO2 represents an interfering species in the H2O channel, and it is known that horizontal gradients in NO2 must be accounted for in the NO2 retrieval for best accuracy of its profile. The V6 (and V5) retrieval does not make such a correction. The asc H2O channel radiances should have little interference from NO2, because of its low values in the upper stratosphere in daytime. However, the descending or nighttime H2O channel radiances may contain a significant fraction from NO2, and that NO2 contribution is being spread uniformly across the tangent layer when it is really concentrated on one side of that layer. Our retrieval approximation could lead to a negative asc/desc

difference in H2O m.r. More analysis is needed to confirm this.

1979 04 03-The day/night (asc/desc) temperature difference
reflects the effects of tides at about 1 pm and 11 pm local
time. Day is greater than night by nearly 4 K at 2 mb and the tropics. The mapped (LAMAT) results for V5 in NASA Tech Paper 3409 are an average of day and night. Thus, when the LAMAT values are compared with the (almost always) local, daytime rocketsonde values, the LAMAT values should be smaller at 2 mb, larger at 0.5 mb, and about the same at 1 mb. There is one-half orbit (desc) missing for the plots of this day.

1979 04 04-There is one-half orbit missing for the plots of this day. There is wave-2 structure in the NH geopotential at 30 mb.

1979 04 05-The 70 mb map of NH HNO3 shows missing orbital segments where there is significant horizontal structure in the mapped field. It is due to similar structure in the ozone field, most likely being flagged by our cloud algorithm.

1979 04 06-Data are OK.

1979 04 07-There are bad points in HNO3 at 36N, 70 mb (desc). Ozone and water also have bad points over N. Africa/S. Europe. There is a noticeable local cooling in the lower stratosphere above the Palmer Peninsula, likely due to ascent of air as it passes over the mountain range.

1979 04 08-The plots of zonal mean V6 - V5 T(p) indicates that V6 will correct most of the biases that showed up in the NASA TP 3409.

1979 04 09-There are more "scans removed" on this day compared with April 8, especially for NO2. Is this because of enhanced spacecraft jitter?

1979 04 10-Data are good.

1979 04 11-The data are OK.

1979 04 12-There is a pentagonal character in the 70 mb SH ozone field.

1979 04 13-The data look good.

1979 04 14-Plots look good.

1979 04 15-There is a collar of NO2 at mid latitudes (40S) of the SH at 30 mb.

1979 04 16-No LIMS measurements for this day.

1979 04 17-Data are OK.

1979 04 18-The LIMS instrument was not taking data on this day.

1979 04 19-In the zonal mean plot of V6 - V5 T(p), V6 is greater by 3 K at 2 mb and 1 mb at 64S. This change improves the agreement between LIMS and the rocketsonde data at Molodezhnaya (68S). Much of the remaining bias can be explained by the fact that there is a 4 to 5 degree separation in latitude for the two sets of profiles.

LIMS was turned off for one orbit.

1979 04 20-There is a noticeable secondary maximum in ozone at 0.02 mb. Most likely the T values are too cold at tops-of-profiles due to the effect of extrapolating upward from the first retrieved layer. Perhaps if we had employed

the MSIS model for top-of-profile shape, we would have obtained better results. For example, compare the asc and desc plots of ozone and then their temperature fields. Ozone should not vary much from day to night at 0.01 mb; yet, it does. But temperature does vary at those altitudes due to tides. The extrapolation of those top layer temperatures to higher altitudes will have an effect on the retrieved ozone.

1979 04 21-There is excess water in lower stratosphere at 55S (asc) just off the Palmer Peninsula at 70 mb. Note that the V6 - V5 desc NO2 zonal mean contour plot has its -20% contour extending down to 15 mb in the tropics. Is this a result of correcting for aerosol effects at low latitudes?

1979 04 22-Data are OK.

1979 04 23-More scans were flagged for "PSC effects" on this day. Is this a day when ERB was scanning and causing enhanced jitter effects?

1979 04 24-There is errant HNO3 and ozone at 60S, 70 mb. The zonal mean desc. NO2 is still showing low values to 30N from high latitudes of the upper stratosphere.

1979 04 25-This day lacks one orbit of data. There is an area of very low ozone over southern Asia at 70 mb.

1979 04 26-There are low values of HNO3 over the Palmer
Peninsula at 70 mb.

1979 04 27-There are high values of HNO3 and ozone at 70 mb near 40S.

1979 04 28-LIMS made no measurements on this day.

1979 04 29-The data are OK.

1979 04 30-The 10 mb plot of NH desc. NO2 shows a ring of high values near 60N. There is a tongue of NO2 in the SH on the 3 mb surface. Both the temp and geop. Vortex is shifted off the SH Pole at 10 mb and 3 mb, respectively.

May 1979

1979 05 01-There are high descending NO2 values at 0.2 mb and about 36N.

1979 05 02-LIMS was off for one orbit.

1979 05 03-Data are OK.

1979 05 04-Data are OK.

1979 05 05-There are no LIMS data for one orbit. This day of data seems to have larger effects from spacecraft jitter. It is one of our test days.

1979 05 06-Data are good.

1979 05 07-Data look good.

1979 05 08-There is a full day of data for this day. However, the V5 polar plots indicate that only one to two orbits were processed.

1979 05 09-Data look good.

1979 05 10-There are rather large V6 - V5 changes in NO2 and H2O at the SH higher latitudes.

1979 05 11-There is some day 131 - day 130 difference in T(p) at the tropical mesopause.

1979 05 12-There are some bad HNO3 and O3 data near 36S and 70 mb over Australia. The V6 - V5 plots for NO2 show significant positive values at 1 mb. Was there jitter on May 12?

1979 05 13-Data are OK.

1979 05 14-The LIMS instrument was off for this day.

1979 05 15-There are some rather large changes in SH NO2 (asc) from May 13 to 15 in the lower mesosphere. There are 12 desc. NO2 profiles at high SH latitudes that exceeded 25 ppbv near 4 mb.

1979 05 16-The SH asc NO2 distribution has reverted back to the values of May 13.

1979 05 17-A number of desc NO2 profiles exceed 25 ppbv in the upper stratosphere at high SH latitudes.

1979 05 18-There are bad HNO3 and ozone points at 52S, 315E and 70 mb.

1979 05 19-Data are OK.

1979 05 20-High desc ozone value at 0.02 mb near 50N. May be an artifact due to presence of a PMC near mesopause and/or its effects in the retrieved T(p).

1979 05 21-Two regions of bad HNO3 and ozone in the lower stratosphere at 64S (Ross Sea) and 36N (western Atlantic).

1979 05 22-The zonal mean plot of V6-V5 HNO3 difference seems to have a pattern at low latitudes that may be an artifact of our removal of the effects of aerosol. High ozone at 0.02 mb, 56N (see comment for May 20). Note that this feature will only be retained in the Level 3 product if it persists for several consecutive days.

1979 05 23-PMC in ozone field at 0.01 to 0.02 mb at 60N? (see comment for May 20).

1979 05 24-LIMS not operating on this day.

1979 05 25-Bad desc ozone point at 60 mb, 53S. Excess ozone at 0.02 mb, 64N.

1979 05 26-Desc NO2 is elevated at 0.2 mb, 60S (mesospheric source?)

1979 05 27-Mesospheric NO2 at SH polar latitudes. PMC effects in ozone at 0.02 mb, 60N?

1979 05 28-V6-V5 water shows significant differences in the lower stratosphere; V6 water is considered more accurate. PMC effects in ozone at 55N, 0.02 mb? LIMS was not operating for one orbit on this day.