



OMPS Total Column Release, Beta Data Quality
Recommended Cautions for Data Users
Last updated November 27, 2012

The JPSS Algorithm Engineering Review Board has reviewed the OMPS Total Column Ozone Data Record products (OMPS-TC-EDR/OOTCO and OMPS-TC-Oz-Fst-Guess-IP/INCTO) and set the Data Quality attribute to Beta. Beta quality is defined as:

- Early release product
- Initial calibration applied
- Minimally validated and may still contain significant errors (rapid changes can be expected)
- Available to allow users to gain familiarity with data formats and parameters
- Product is not appropriate as the basis for quantitative scientific publications, studies and applications

Even though both products have advanced to Beta Data Quality, the recommendation is to use the OMPS-TC-Oz-Fst-Guess-IP/INCTO until one or both products advance to Provisional Data Quality. The HDF format of the two products is the same. The INCTO product has its retrievals in the columnamounto3 parameter and no value in the firstguesscolumnamounto3 parameter. Because of inter-channel calibration inaccuracies, many error and data quality flag bits are currently set. All non-fill ozone values in INCTO **except** the following flagged cases may be used for Beta evaluation purposes:

1. Error Flag Bit 8 set to 1 – Ozone out of range, i.e., < 50 DU or > 650 DU,
2. Quality Flag #1 Bit 1 set to 0 – no retrieval,
3. Quality Flag #1 Bit 7 set to 1 – SZA > 88 degrees, and
4. Quality Flag #2 Bit 3 set to 1 – Solar eclipse in FOV.

The Board recommends that users be aware of certain specific data product characteristics. The product caveats for OMPS Total Column Ozone products at this time are:

1. The OMPS-TC-EDR product quality was degraded by an erroneous implementation applying the VIIRS cloud fraction information globally instead of just over snow/ice as designed. This dependence has been corrected as of the implementation of build Mx6.4 on October 15, 2012. In addition, this total column ozone product is dependent upon cloud top pressure, snow/ice coverage and atmospheric temperature profile data products derived from the VIIRS and CrIS sensors. Until those products complete their validation process, their use will create errors in this ozone product.
2. Discontinuities in both of the OMPS Total Column Ozone products' performance (particularly accuracy) can be expected as calibration (e.g., dark current, transfer smear, and linearity corrections) and solar spectra (e.g., day one solar spectra and wavelength scales) tables are updated, and the OMPS SDR products progress toward provisional maturity. Additional details are provided below.
3. Fixes for some known problems are scheduled for implementation in the last five months of 2012 (e.g., implementation of adjustments to the solar spectra for Earth/Sun distance, new radiative transfer tables, a new cloud top pressure climatology, and new algorithm logic for partial cloud computations). These will also produce changes in the products' accuracy and precision.



Further as the ozone products are derived from the OMPS SDR products, the Board recommends that users be aware of certain specific data product characteristics. The product caveats for OMPS Nadir Mapper SDR products at this time are:

1. The OMPS NM and NP SDR processing was designed to automatically generate dark current estimates. This is being done less frequently than originally planned. Since the dark current is changing, these estimates may be inaccurate. We will begin providing weekly characterizations from direct analysis by a human-in-the-loop at some point in the future.
2. The Solar spectra currently provided in the OMPS NM and NP Earth View SDRs are synthetic proxies created from high-resolution reference solar spectra convolved with prelaunch bandpass measurements. These will be replaced with on-orbit OMPS-measured spectra, from preliminary analysis, in the June/July 2012 time frame. More accurate Day One solar spectra will be provided at a later date.
3. The wavelength scale for the OMPS NM and NP for both Earth and Solar spectra are based on pre-launch measurements. We are studying spectral features (e.g., Fraunhofer lines) to verify/characterize the on-orbit behavior. Initial indications are that potential adjustments to the wavelength scales will be at the Ångstrom level.
4. While the OMPS NP South Atlantic Anomaly (SAA) flag is working well in identifying regions with higher frequency of charged particles, we expect to optimize it as more results become available and are analyzed.
5. Out-of-band stray light is present in the OMPS NP measurements at the units percent level. The stray light was characterized on the ground. We are designing and testing stray light corrections with the in-orbit data for future implementation.
6. The CCD smear corrections can be affected by charged particles. This has been observed to create a bias, albeit infrequently, in the smear corrections for an individual row. We are developing corrections and screening to handle this complication.
7. The non-linearity corrections for both the OMPS NP and OMPS NM used in the SDR processing are derived from the prelaunch characterization. In-orbit measurements show negligible changes, so updates to these tables are low priority.
8. OMPS NM SDR product dimensions allow for a future change in the horizontal resolution to much smaller FOVs. Most of the parameters in an HDF granule have spatial dimensions of 105 cross-track by 15 along-track. Currently, with the nadir FOV size set at $50 \times 50 \text{ KM}^2$, only the first 35 cross-track by 5 along-track cells are used to store actual measurements, so eight ninths of the values will be zeros or fill values for a normal case. The OMPS NP SDR products allow for a future change in the horizontal resolution as well, from one $250 \times 250 \text{ KM}^2$ FOV to twenty-five $50 \times 50 \text{ KM}^2$ FOVs. Currently only the first cross-track by first along-track cell contains an actual measurement, so twenty-four twenty-fifths of the cells contain zeroes or fill values.