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The new 1.1.3 version
of the
L0- > L1b dataprocessing
software

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Introduction

- A new version 1.1.3 of the GDPS (L0 -> L1b Ground Data Processing Software) has been developed.
- This new version is operational in the forward stream from orbit 29515 (Feb 1st 2010) onwards.
- The new version will be operational in the NRT stream starting about mid February 2010.
- The new version provides more information about the row anomaly.
- The new version does NOT correct for the errors caused by the row anomaly (see future plans at end of presentation).



XtrackQualityFlags

- The content of the XTrackQualityFlags field in the L1b data products (flagging the OMI groundpixels that are affected by the row anomaly) is now based on a look-up table which is kept up to date.
- The content of the look-up table is currently mainly based on the results of L1b data analysis.
- So far, the XTrackQualityFlags field only contained static information that was only defined once back in October 2008.
- With the new version 1.1.3 the content of the XTrackQualityFlags field reflects the current status of the row anomaly. The look-up table will be updated when needed. Based on the current behavior of the row anomaly, a typical update frequency for the look-up table is expected to be once per month.



WavelengthFit

- Four new fields have been added to the L1b data products:
 - WavelengthFitCoefficient
 - WavelengthFitCoefficientPrecision
 - WavelengthFitChiSquare
 - WavelengthFitFlags
- These fields contain information about a wavelength fit that now is performed in the L0 - > L1b data processor for each row. This fit properly accounts for the wavelength shift that is caused by the row anomaly.
- This wavelength calibration yields accurate results for rows effected by the row anomaly.
- This wavelength calibration also yields more accurate results than previously for rows that are not effected by the row anomaly.
- The already existing wavelength assignment fields (WavelengthCoefficient, WavelengthCoefficientPrecision and WavelengthReferenceColumn) remain available as before in the new L1b data products.



OrbitPhase

- A new field “Orbitphase” has been added to the L1b data products.
- This “Orbitphase” field contains the orbit phase for each radiance measurement. The numerical value runs from 0 at spacecraft midnight to 1 at the following spacecraft midnight.
- This field might be helpful for the data user when analyzing the orbit phase dependent impact of the row anomaly.



Noise calculation

- An improved noise calculation is being used for all three channels (UV1, UV2 and VIS).
- The new calculation properly accounts for the co-addition factors.
- The following equation shows the calculation of the noise:

$$Noise(i, j)_k = \frac{\sqrt{N_{co-addition,k} \cdot S_{input}(i, j)_k + N_{co-addition,k} \cdot \sigma_{read-out,k,g}^2}}{N_{co-addition,k}}$$



Documentation

- For more details, see the updated readme file available on the DISC website and the Input/Output Data Specification (IODS) document which the readme file is referring to:

http://disc.sci.gsfc.nasa.gov/Aura/data-holdings/OMI/documents/v003/OMI_Level_1b_README_V003.pdf



Feedback needed!

- **The OMI L2 developers are strongly urged to investigate improvement possibilities for their L2 PGE's** taking the new provided information in the L1b data products into account, especially the wavelength fit information.
- **Feedback from the L2 data users** on how the new L1b data impact their L2 products, or observations of row anomaly effects and the quality of our flagging of the row anomaly **is essential**.
- Point of contact:
KNMI / Jacques Claas (mail to claas@knmi.nl).



Future plans

- The development team at KNMI is working hard towards version 1.1.4 of the L0 -> L1b data processor.
- This version 1.1.4 will correct for the multiplicative effect caused by the row anomaly blockage.
- Reprocessing all OMI data for Collection 4 will not start before the release of version 1.1.4.
- After the 1.1.4 release, the development team continues with developing correction algorithms for the additive errors (radiance shine and sun light) caused by the row anomaly.