OMI Level 1b README File

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Overview

This document provides a brief description of the Ozone Monitoring Instrument (OMI) Level 1b data product. This product contains calibrated radiance and irradiance spectra together with quality information and metadata. The radiance product contains in addition extensive geolocation and ancillary information.

The OMI instrument has two channels in the ultraviolet (UV) and visible (VIS) wavelength range. The UV channel is split in two sub-channels: UV1 and UV2. During nominal operations OMI performs about 1650 along track measurements on the dayside of the orbit, which take 2 seconds each. Each measurement corresponds to 60 cross-track ground pixels. In the so-called global mode these 60 cross-track ground pixels cover a swath of approximately 2600 km (global spatial resolution) and in the so-called spatial-zoom mode a swath of 750 km (zoom spatial resolution).

The OMI Level 1b set of products consists of six individual products (types of data files and metadata files). These are given in the Table below.

Product name	Product description
OML1BRUG	Level 1b UV radiances for global spatial resolution
OML1BRVG	Level 1b VIS radiances for global spatial resolution
OML1BRUZ	Level 1b UV radiances for zoom spatial resolution
OML1BRVZ	Level 1b VIS radiances for zoom spatial resolution
OML1BIRR	Level 1b irradiances for global or zoom spatial resolution
OML1BCAL	Level 1b calibration measurements

OML1BRUG and OML1BRVG products are generated when the instrument is measuring in global mode, but also when the instrument is measuring in spatial-zoom mode. In the latter case the OML1BRUG and OML1BRVG are measured on spatial-zoom resolution and binned to

global spatial resolution. OML1BRUZ and OML1BRVZ products are only generated in spatial-zoom mode.

The OML1BCAL product is not needed for Level 2 data generation and is specifically developed to support the instrument calibration team.

You may refer to the release [specific information about OMI L1b](#) for details about software versions and known problems.

The Level 1b set of products is generated by the Ground Data Processing System (GDPS) software. The latest version is v1.1.3.

Algorithm Description

The OMI instrument and an early version of the GDPS are described in the [OMI Algorithm Theoretical Basis Document (ATBD)](#).

Data Quality Assessment

The OMI L1b product has not been validated but has been subjected to analyses by the OMI Calibration Team. A complete description of known instrumental effects that affect the OMI L1b products can be found [here](#).

Product Description

A single OMI L1b radiance file contains all OMI measurements for the sunlit part of a single Aura orbit. An OMI L1b irradiance file (OML1BIRR) contains a single irradiance measurement.

For orbits that OMI performs global measurements the results are written in the OML1BRUG and OML1BRVG products. The number of cross-track ground pixels is 60.

For orbits that OMI performs zoom measurements the results are written in the OML1BRUZ and OML1BRVZ products. The number of cross-track pixels is 60. Furthermore, the zoom measurements are brought on the Global spatial resolution by rebinning (by a factor of 2) in the cross-track direction and stored in the OML1BRUG and OML1BRVG products. Because of the rebinning the number of cross-track ground pixels is 30 in OML1BRUG and OML1BRVG for zoom orbits.

The InstrumentConfigurationId field contains an integer value that corresponds uniquely to a different type of instrument measurement configuration. Of primary interest to users will be the difference between spatial-zoom and global radiance and irradiance measurements. The

global identifiers are 0, 1, 2, and 8 while the spatial-zoom identifiers are 42, 43, 44, and 50 (which in both cases refer to tropical, mid-latitude, arctic and solar irradiance measurements, respectively). Other instrument configuration identifiers should not be used for normal retrievals.

Before using the data products, all users are encouraged to read the [Input and Output Data Specification (IODS)](#), that contains a complete description of the format of the OMI L1b data. The Operational Parameter File (OPF) is described in detail [here](#).

Where to find the level-1b OMI data?

The OMI L1b products are made available through the NASA S4PA system (https://disc.gsfc.nasa.gov/datasets?keywords=OMI&processingLevel=1B). The publicly released level-1b data can be found in the Version-003 OMI data collection. Questions related to the OMI dataset should be directed to the [GES DAAC](#).

The OMI L1b products are written as an HDF-EOS2.13 swath file. For a list of tools that read HDF-EOS2.13 data files please visit this link: https://hdfeos.org/index.php

For questions and comments related to the OMI L1b algorithm and data quality please send email to contact Quintus Kleipool (kleipool@knmi.nl). When using the L1b data for validation and retrieval purposes please check the list of known issues [here](#) to see if observed effects are already known and documented.

Suggestions for using the product

When using the OMI L1b products for the generation of Level 2 data products it is important to consider the flags in the product files. Detailed information about the flags is given in the IODS. An indication which flags require special attention can be found [here](#). This information does not apply to users of OML1BCAL.

Web site

More information about the Version-003 OMI data collection can be found on-line at:
http://www.knmi.nl/omi/research/calibration/instrument_status_v3/index.html

This site contains, besides more generic information about the OMI instrument and the measurement configurations, an orbit-to-orbit

overview of the Version-003 OMI data collection in terms of measurement anomalies that may have occurred, ground track coverage, pixel and measurement quality flag statistics, etc. In addition, the long-term statistics of the instrument performance behaviour and flagging statistics are also available.