Shortname: OMAERUV
Longname: OMI/Aura Near UV Aerosol Optical Depth and Single
Scattering Albedo 1-Orbit L2 Swath 13x24km
PFS Version: 1.1.9
Date: 10 April 2011
Author(s):   Changwoo Ahn (SSAI), Ellyne Kinney(SSAI) and Omar Torres
(NASA-GSFC)

PGE Version: 1.3.7
Lead Algorithm Scientist: Omar Torres(NASA-GSFC)
PGE Developer(s): Changwoo Ahn, Ellyne Kinney, Dev Roy and Shifang Luo
(all SSAI)

Description:

  This document specifies the product format for the OMAERUV Level 2 PGE,
  which uses the V8 TOMS algorithm to estimate Aerosol Single Scattering
Albedo and Absorption
  Optical Depth from OMI UV-2 measurements (Reference 1).The product is
stored
  as one HDF-EOS 5 swath file for each granule (i.e., one orbit) of OMI
Level 1B
  data, and has a size range of 5 to 500 Mb.

Global Metadata:

 - Metadata Name: AuthorAffiliation
   Mandatory: T
   Data Type: HE5T_NATIVE_CHAR
   Number of Values: 1
   Range or Valids: Not applicable (free format)
   Data Source: PCF
   Description: Example is "NASA-GSFC"

 - Metadata Name: AuthorName
   Mandatory: T
   Data Type: HE5T_NATIVE_CHAR
   Number of Values: 1
   Range or Valids: Not applicable (free format)
   Data Source: PCF
   Description: Example is "Omar Torres"

 - Metadata Name: GranuleDay
   Mandatory: T
   Data Type: HE5T_NATIVE_INT
   Number of Values: 1
   Range or Valids: 1 to 31
   Data Source: PGE
   Description: The day of the month at the start of the granule

 - Metadata Name: GranuleMonth

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      Mandatory:           T
      Data Type:           HE5T_NATIVE_INT
      Number of Values:    1
      Range or Valids:     1 to 12
      Data Source:         PGE
      Description:         The month at the start of the granule

   - Metadata Name:        GranuleYear
      Mandatory:           T
      Data Type:           HE5T_NATIVE_INT
      Number of Values:    1
      Range or Valids:     2003 to 2099
      Data Source:         PGE
      Description:         The (four-digit) year at the start of the granule

   - Metadata Name:        HDFEOSVersion
      Mandatory:           T
      Data Type:           HE5T_NATIVE_CHAR
      Number of Values:    1
      Range or Valids:     Automatically set by HDF-EOS
      Data Source:         HE
      Description:         Example is "HDFEOS_5.1.5"

   - Metadata Name:        InputVersions
      Mandatory:           T
      Data Type:           HE5T_NATIVE_CHAR
      Number of Values:    1
      Range or Valids:     Not applicable (free format)
      Data Source:         PGE
      Description:         A list of every ESDT (including version) whose
product was used as

                           input for the processing.

   - Metadata Name:        InstrumentName
      Mandatory:           T
      Data Type:           HE5T_NATIVE_CHAR
      Number of Values:    1
      Range or Valids:     Valids are "HIRDLS", "MLS", "OMI" and "TES"
      Data Source:         PGE
      Description:         Actual is "OMI" (see Section 6.1 of Reference 2)

   - Metadata Name:        OrbitData
      Mandatory:           T
      Data Type:           HE5T_NATIVE_CHAR
      Number of Values:    1
      Range or Valids:     Valids are "DEFINITIVE" and "PREDICTED"
      Data Source:         L1B
      Description:         Indicates whether orbit data used by the L1B
processor is definitive or predicted.

   - Metadata Name:        PGEVersion
      Mandatory:           T
      Data Type:           HE5T_NATIVE_CHAR
      Number of Values:    1
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      Range or Valids:    Range is "0.0.0" to "9.9.99"
      Data Source:        PCF
      Description:        Example is "0.9.22" (see Appendix K of Reference 3)

   - Metadata Name:       ProcessLevel
     Mandatory:           T
     Data Type:           HE5T_NATIVE_CHAR
     Number of Values:    1
     Range or Valids:     Valids are "L1b", "L2" and "L3"
     Data Source:         PGE
     Description:         Actual is "L2"

   - Metadata Name:       ProcessingCenter
     Mandatory:           T
     Data Type:           HE5T_NATIVE_CHAR
     Number of Values:    1
     Range or Valids:     Not applicable (free format)
     Data Source:         PCF
     Description:         Example is "OMIDAPS"

   - Metadata Name:       ProcessingHost
     Mandatory:           T
     Data Type:           HE5T_NATIVE_CHAR
     Number of Values:    1
     Range or Valids:     Not applicable (free format)
     Data Source:         PCF
     Description:         The output from executing the Unix "uname -a"
command on the
       processing machine.

   - Metadata Name:       TAI93At0zOfGranule
     Mandatory:           T
     Data Type:           HE5T_NATIVE_DOUBLE
     Number of Values:    1
     Range or Valids:     0.0d+00 to 1.0d+30
     Data Source:         PGE
     Description:         The TAI93 time at 0z of the granule (see Section
6.1 of Reference 2).


Swath Metadata:

   - Metadata Name:       EarthSunDistance
     Mandatory:           T
     Data Type:           HE5T_NATIVE_FLOAT
     Number of Values:    1
     Range or Valids:     1.47e+11 to 1.53e+11
     Data Source:         L1B
     Description:         The Earth-sun distance (in m) at the time of the
irradiance measurement.

   - Metadata Name:       NVXAdjustment
     Mandatory:           T
     Data Type:           HE5T_NATIVE_FLOAT
```

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   Number of Values:  180
   Minimum Value:     -5.0
   Maximum Value:     5.0
   Data Source:       PGE
   Description:       The N-Value adjustments for the 3 wavelengths and
60 cross-track scan
   positions.

 - Metadata Name:     NumTimes
   Mandatory:         T
   Data Type:         HE5T_NATIVE_INT
   Number of Values:  1
   Range or Valids:   0 to 9999
   Data Source:       L1B
   Description:       The number of "scan" lines in the swath

 - Metadata Name:     NumTimesSmallPixel
   Mandatory:         T
   Data Type:         HE5T_NATIVE_INT
   Number of Values:  1
   Range or Valids:   0 to 9999
   Data Source:       L1B
   Description:       The number of small pixel "scan" lines in the swath

 - Metadata Name:     Altitude
   Mandatory:         T
   Data Type:         HE5T_NATIVE_FLOAT
   Number of Values:  5
   Range or Valids:   0.0 to 10.0
   Data Source:       PGE
   Description:  Aerosol layer altitude levels (in km) at which the PGE
executes the retrieval.

 - Metadata Name:     SwathName
   Mandatory:         T
   Data Type:         HE5T_NATIVE_CHAR
   Number of Values:  1
   Range or Valids: >Valid is "OMI Aerosol Extinction and Absorption
Optical Depth"

   Data Source:       PGE
   Description: >


 - Metadata Name:     VerticalCoordinate
   Mandatory:         T
   Data Type:         HE5T_NATIVE_CHAR
   Number of Values:  1
   Range or Valids: >

      Valids are "Pressure", "Altitude", "Potential Temperature" and
      "Total Column".

   Data Source:       PGE
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        Description: >

            Actual is "Altitude" (see Section 6.2 of Reference 2).

    Swath Dimensions:

     - Dimension Name:     nXtrack
       Data Type:          HE5T_NATIVE_INT
       Dimension Type:     FIXED
       Number of Values:   1
       Range or Valids:    1 to 60
       Data Source:        L1B
       Description:        The number of ground pixels per "scan" line

     - Dimension Name:     nLayers
       Data Type:          HE5T_NATIVE_INT
       Dimension Type:     FIXED
       Number of Values:   1
       Range or Valids:    1 to 11
       Data Source:        PGE
       Description: >

            The number of layers in the aerosol profile per ground pixel.

     - Dimension Name:     nTimes
       Data Type:          HE5T_NATIVE_INT
       Dimension Type:     FIXED
       Number of Values:   1
       Range or Valids:    0 to 9999
       Data Source:        L1B
       Description:        The number of "scan" lines in the swath

     - Dimension Name:     nTimesSmallPixel
       Data Type:          HE5T_NATIVE_INT
       Dimension Type:     FIXED
       Number of Values:   1
       Range or Valids:    0 to 9999
       Data Source:        L1B
       Description:        The number of small pixel "scan" lines in the swath

     - Dimension Name:     nWavel
       Data Type:          HE5T_NATIVE_INT
       Dimension Type:     FIXED
       Number of Values:   1
       Range or Valids:    1 to 750
       Data Source:        PGE
       Description:        The number of wavelengths per ground pixel

    Geolocation Fields:

     - Field Name:             XTrackQualityFlags
       Data Type:              HE5T_NATIVE_UINT8
       Dimensions:             nXtrack,nTimes
       Minimum Value:          0
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   Maximum Value:             254
   Missing Value:             255
   Offset:            0.0
   Scale Factor:      1.0
   Units:             NoUnits
   Data Source:       L1B
   Title:                     "Cross Track Quality Flags"
   Unique Field Definition:  OMI-Specific
   Description: >

     The cross track quality flags assigned to each pixel in
     OMI L1B data. Flags indicate detection of the OMI row
     anomaly and if the effect has been corrected.
     Bits 0 to 2 together indicate row anomaly status:
        0         - Not affected
        1    - Affected, Not corrected, do not use
        2    - Slightly affected, not corrected, use with caution
        3         - Affected, corrected, use with caution
        4    - Affected, corrected, use pixel
        5    - Not used
        6    - Not used
        7    - Error during anomaly detection processing
     Bit 3 - Reserved for future use.
     Bit 4 - Possibly affected by wavelength shift
     Bit 5 - Possibly affected by blockage
     Bit 6 - Possibly affected by stray sunlight
     Bit 7 - Possibly affected by stray earthshine

 - Field Name:              GroundPixelQualityFlags
   Data Type:               HE5T_NATIVE_UINT16
   Dimensions:              nXtrack,nTimes
   Range or Valids:         Not meaningful
   Missing Value:           65535
   Offset:                  0.0d0
   Scale Factor:            1.0d0
   Units:                   NoUnits
   Data Source:             L1B
   Title:                   "Ground Pixel Quality Flags"
   Unique Field Definition:  OMI-Specific
   Description: >

     Bits 0 to 3 together contain the land/water flags:
        0    - shallow ocean
        1    - land
        2    - shallow inland water
        3    - ocean coastline/lake shoreline
        4    - ephemeral (intermittent) water
        5    - deep inland water
        6    - continental shelf ocean
        7    - deep ocean
        8-14 - not used
        15   - error flag for land/water
     Bits 4 to 6 are flags that are set to 0 for FALSE, or 1 for TRUE:
        Bit 4 - sun glint possibility flag
```

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      Bit 5 - solar eclipse possibility flag
      Bit 6 - geolocation error flag
    Bit 7 is reserved for future use (currently set to 0)
    Bits 8 to 14 together contain the snow/ice flags (based on NISE):
      0       - snow-free land
      1-100   - sea ice concentration (percent)
      101     - permanent ice (Greenland, Antarctica)
      102     - not used
      103     - dry snow
      104     - ocean (NISE-255)
      105-123 - reserved for future use
      124     - mixed pixels at coastline (NISE-252)
      125     - suspect ice value (NISE-253)
      126     - corners undefined (NISE-254)
      127     - error
    Bit 15 - NISE nearest neighbor filling flag
    (See Section 6.2 of Reference 4 for more details.)

- Field Name:             Latitude
  Data Type:              HE5T_NATIVE_FLOAT
  Dimensions:             nXtrack,nTimes
  Range or Valids:        Range is -90.0 to 90.0
  Missing Value:          -1.2676506e+30
  Offset:                 0.0d+00
  Scale Factor:           1.0d+00
  Units:                  deg
  Data Source:            L1B
  Title:                  "Geodetic Latitude (deg)"
  Unique Field Definition: Aura-Shared
  Description: >

    The geodetic latitude (in deg) at the center of the ground pixel.

- Field Name:             Longitude
  Data Type:              HE5T_NATIVE_FLOAT
  Dimensions:             nXtrack,nTimes
  Range or Valids:        Range is -180.0 to 180.0
  Missing Value:          -1.2676506e+30
  Offset:                 0.0d+00
  Scale Factor:           1.0d+00
  Units:                  deg
  Data Source:            L1B
  Title:                  "Geodetic Longitude (deg)"
  Unique Field Definition: Aura-Shared
  Description: >

    The geodetic longitude (in deg) at the center of the ground pixel.

- Field Name:             RelativeAzimuthAngle
  Data Type:              HE5T_NATIVE_FLOAT
  Dimensions:             nXtrack,nTimes
  Range or Valids:        Range is -180.0 to 180.0
  Missing Value:          -1.2676506e+30
  Offset:                 0.0d+00
```

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   Scale Factor:              1.0d+00
   Units:                     deg(EastofNorth)
   Data Source:               L1B
   Title: >

     "Relative (sun + 180 - view) Azimuth Angle (deg)"

   Unique Field Definition:  OMI-Specific
   Description: >

     The relative (sun + 180 - view) azimuth angle (in deg) at the center
     of the ground pixel.

- Field Name:                SolarZenithAngle
  Data Type:                 HE5T_NATIVE_FLOAT
  Dimensions:                nXtrack,nTimes
  Range or Valids:           0.0 to 180.0
  Missing Value:             -1.2676506e+30
  Offset:                    0.0d+00
  Scale Factor:              1.0d+00
  Units:                     deg
  Data Source:               L1B
  Title:                     "Solar Zenith Angle (deg)"
  Unique Field Definition:  Aura-Shared
  Description: >

     The solar zenith angle (in deg) at the center of the ground pixel.

- Field Name:                TerrainPressure
  Data Type:                 HE5T_NATIVE_FLOAT
  Dimensions:                nXtrack,nTimes
  Range or Valids:           Range is 0.0 to 1013.0
  Missing Value:             -1.2676506e+30
  Offset:                    0.0d+00
  Scale Factor:              1.0d+00
  Units:                     mbar
  Data Source:               L1B
  Title:                     "Terrain Pressure (mbar)"
  Unique Field Definition:  Aura-Shared
  Description: >

     The terrain pressure (in mbar) at the center of the ground pixel.

- Field Name:                SecondsInDay
  Data Type:                 HE5T_NATIVE_FLOAT
  Dimensions:                nTimes
  Range or Valids:           0.0d+00 to 86401.0
  Missing Value:             -1.2676506e+30
  Offset:                    0.0d+00
  Scale Factor:              1.0d+00
  Units:                     s
  Data Source:               L1B
  Title:                     "Seconds in Day at Start of Scan (s)"
  Unique Field Definition:  Aura-Shared
```

```
      Description: >

         The time of day (in s) at the start of the "scan".

   - Field Name:              Time
     Data Type:               HE5T_NATIVE_DOUBLE
     Dimensions:              nTimes
     Range or Valids:         0.0d+00 to 1.0d+10
     Missing Value:           -1.2676506002282294e+30
     Offset:                  0.0d+00
     Scale Factor:            1.0d+00
     Units:                   s
     Data Source:             L1B
     Title:                   "Time at Start of Scan (s, TAI93)"
     Unique Field Definition: Aura-Shared
     Description: >

         The TAI93 time (in s) at the start of the "scan".

   - Field Name:              ViewingZenithAngle
     Data Type:               HE5T_NATIVE_FLOAT
     Dimensions:              nXtrack,nTimes
     Range or Valids:         0.0 to 180.0
     Missing Value:           -1.2676506e+30
     Offset:                  0.0d+00
     Scale Factor:            1.0d+00
     Units:                   deg
     Data Source:             L1B
     Title:                   "Viewing Zenith Angle (deg)"
     Unique Field Definition: OMI-Specific
     Description: >

         The viewing zenith angle (in deg) at the center of the ground pixel.

   Data Fields:

   - Field Name:              FinalAerosolLayerHeight
     Data Type:               HE5T_NATIVE_FLOAT
     Dimensions:              nXtrack,nTimes
     Range or Valids:         0.0 to 10.0
     Missing Value:           -1.2676506e+30
     Offset:                  0.0d+00
     Scale Factor:            1.0d+00
     Units:                   km
     Data Source:             PGE
     Title:                   "Final Aerosol Layer Height (km)"
     Unique Field Definition: OMI-Specific
     Description: >

         The aerosol layer height (in km) associated with the ground pixel.

   - Field Name:              AerosolSingleScattAlbVsHeight
     Data Type:               HE5T_NATIVE_FLOAT
     Dimensions:              nWavel,nLayers,nXtrack,nTimes
```

```
   Range or Valids:              0.0 to 1.0
   Missing Value:                -1.2676506e+30
   Offset:                       0.0d+00
   Scale Factor:                 1.0d+00
   Units:                        NoUnits
   Data Source:                  PGE
   Title:                        "Aerosol Single Scattering Albedo (SSA) at 5
heights"
   Unique Field Definition:  OMI-Specific
   Description: >

     The aerosol single scattering albedo solution associated with the
ground pixel for
     five (5) aerosol layer heights.

 - Field Name:                   AerosolAbsOpticalDepthVsHeight
   Data Type:                    HE5T_NATIVE_FLOAT
   Dimensions:                   nWavel,nLayers,nXtrack,nTimes
   Range or Valids:              0.0 to 0.5
   Missing Value:                -1.2676506e+30
   Offset:                       0.0d+00
   Scale Factor:                 1.0d+00
   Units:                        NoUnits
   Data Source:                  PGE
   Title:                        "Aerosol Absorption Optical Depth at 5
heights"
   Unique Field Definition:  OMI-Specific
   Description: >

     The aerosol absorption optical depth solution associated with the
     ground pixel for five (5) aerosol layer heights.

 - Field Name:                   AerosolOpticalDepthVsHeight
   Data Type:                    HE5T_NATIVE_FLOAT
   Dimensions:                   nWavel,nLayers,nXtrack,nTimes
   Range or Valids:              0.0 to 4.0
   Missing Value:                -1.2676506e+30
   Offset:                       0.0d+00
   Scale Factor:                 1.0d+00
   Units:                        NoUnits
   Data Source:                  PGE
   Title:                        "Aerosol Optical Depth at 5 heights"
   Unique Field Definition:  OMI-Specific
   Description: >

     The aerosol optical depth solution associated with the
     ground pixel for five (5) aerosol layer heights.

 - Field Name:                   AerosolType
   Data Type:                    HE5T_NATIVE_UINT8
   Dimensions:                   nXtrack,nTimes
   Range or Valids:              Valids are 1, 2, 3, and 255
   Missing Value:                255
   Offset:                       0.0d+00
```

```
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Aerosol Type"
   Unique Field Definition: OMI-Specific
   Description: >

      The aerosol type associated with the ground pixel.

        1 - Smoke
        2 - Dust
        3 - Sulfate
      255 - Unknown

 - Field Name:             FinalAlgorithmFlags
   Data Type:              HE5T_NATIVE_UINT16
   Dimensions:             nXtrack,nTimes
   Range or Valids:        0 to 8
   Missing Value:          65535
   Offset:                 0.0d+00
   Scale Factor:           1.0d+00
   Units:                  NoUnits
   Data Source:            PGE
   Title:                  "Final Algorithm Flags"
   Unique Field Definition: OMI-Specific
   Description: >

      The final algorithm flag associated with the ground pixel:

      Aerosol extinction Optical Depth (AOD), Single Scattering
Albedo(SSA),
      and Aerosol Absorption Optical Depth(AAOD)
      Retrievals:
        0 - Most reliable (AAOD, SSA, and AOD)
        1 - Reliable (AAOD only)
        2 - Less reliable for all products

      Not Reliable/No Retrievals:
        3 - Out-of-bounds SSA or AOD above 6.0 at 500nm.
        4 - Cloud/snow/ice contaminated data.
        5 - Solar Zenith Angle above threshold (70 degrees).
        6 - Sun glint angle below threshold over water (40 degrees).
        7 - Terrain Pressure below threshold (628.7 hPa).
        8 - Cross track anomaly.

 - Field Name:             AlgorithmFlagsVsHeight
   Data Type:              HE5T_NATIVE_UINT16
   Dimensions:             nLayer,nXtrack,nTimes
   Range or Valids:        0 to 8
   Missing Value:          65535
   Offset:                 0.0d+00
   Scale Factor:           1.0d+00
   Units:                  NoUnits
   Data Source:            PGE
```

```
    Title:                    "Algorithm Flags at 5 heights"
    Unique Field Definition:  OMI-Specific
    Description: >

    The algorithm flag associated with the ground pixel for each height:

    Aerosol Single Scattering Albedo(SSA) and Aerosol Absorption Optical
Depth(AAOD)
    Retrievals for each heihgt:
    The same criteria used for the FinalAlgorithmFlags are applied for
each height.

 - Field Name:              FinalAerosolSingleScattAlb
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel,nXtrack,nTimes
   Range or Valids:         0.0 to 1.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Best Aerosol Single Scattering Albedo
(omega)"
   Unique Field Definition:  OMI-Specific
   Description: >

    The best aerosol single scattering albedo solution associated with
the ground pixel.

 - Field Name:              FinalAerosolOpticalDepth
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel,nXtrack,nTimes
   Range or Valids:         0.0 to 4.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Best Aerosol Optical Depth "
   Unique Field Definition:  OMI-Specific
   Description: >

    The best aerosol optical depth solution associated with the
    ground pixel.

 - Field Name:              FinalAerosolAbsOpticalDepth
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel,nXtrack,nTimes
   Range or Valids:         0.0 to 0.5
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
```

```
      Title:                  "Best Aerosol Absorption Optical Depth "
   Unique Field Definition:  OMI-Specific
   Description: >

      The best aerosol absorption optical depth solution associated with
the
      ground pixel.

 - Field Name:              ImaRefractiveIndex
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel,nLayers,nXtrack,nTimes
   Range or Valids:         0.0 to 1.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Imaginary Refractive Index"
   Unique Field Definition:  OMI-Specific
   Description: >

      The imaginary component of the refractive index solution associated
with
      the ground pixel.

 - Field Name:              MeasurementQualityFlags
   Data Type:               HE5T_NATIVE_UINT16
   Dimensions:              nTimes
   Range or Valids:         Not meaningful.
   Missing Value:           65535
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Measurement Quality Flags"
   Unique Field Definition:  OMI-Specific
   Description: >

      Bits
        0 - Test Mode
        1 - Alternative Engineering Data
        2 - Alternating Sequencing Readout
        3 - Co-adder Error
        4 - Invalid Co-addition Period
        5 - Co-addition Possibility
        6 - Measurement Combination
        7 - Rebinning
        8 - Dark Current Correction Processing Option
        9 - Detector Smear Calculation Procesing Option
       10 - SAA Possibility
       11 - Spacecraft Maneuver
       12 - Geolocation Error
       13 - 15  Reserved
```

```
- Field Name:            PixelQualityFlags
  Data Type:             HE5T_NATIVE_UINT16
  Dimensions:            nWavel,nXtrack,nTimes
  Range or Valids:       Not meaningful.
  Missing Value:         65535
  Offset:                0.0d+00
  Scale Factor:          1.0d+00
  Units:                 NoUnits
  Data Source:           PGE
  Title:                 "Pixel Quality Flags"
  Unique Field Definition:  OMI-Specific
  Description: >

    Bits
       0 - Missing
       1 - Bad Pixel
       2 - Processing Error
       3 - Transient Pixel Warning
       4 - RTS Pixel Warning
       5 - Saturation Possibility Warning
       6 - Noise Calculation Warning
       7 - Dark Current Warning
       8 - Offset Warning
       9 - Exposure Smear Warning
      10 - Stray Light Warning
      11 - 13  Reserved
      14 - Dead Pixel Identifcation       (OML1BCAL only)
      15 - Dead Pixel Identifcation Error (OML1BCAL only)

- Field Name:            NormRadiance
  Data Type:             HE5T_NATIVE_FLOAT
  Dimensions:            nWavel,nXtrack,nTimes
  Range or Valids:       Range is 0.0 to 1.0
  Missing Value:         -1.2676506e+30
  Offset:                0.0d+00
  Scale Factor:          1.0d+00
  Units:                 NoUnits
  Data Source:           PGE
  Title:                 "Normalized Radiance"
  Unique Field Definition:  OMI-Specific
  Description: >

    The Normalized Radiance is the Radiance / Irradiance ratio.

- Field Name:            Reflectivity
  Data Type:             HE5T_NATIVE_FLOAT
  Dimensions:            nWavel,nXtrack,nTimes
  Range or Valids:       Range is 0.0 to 1.0
  Missing Value:         -1.2676506e+30
  Offset:                0.0d+00
  Scale Factor:          1.0d+00
  Units:                 NoUnits
  Data Source:           PGE
  Title:                 "Lambert Equivalent Reflectivity"
```

```
   Unique Field Definition:  OMI-Specific
   Description: >

    The Lambert equivalent reflectivity associated with the ground
pixel.

 - Field Name:              Wavelength
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel
   Range or Valids:         Range is 300.0 to 600.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   nm
   Data Source:             PGE
   Title:                   "Wavelength"
   Unique Field Definition:  OMI-Specific
   Description: >

    The wavelengths associated with the ground pixel.

 - Field Name:              SurfaceAlbedo
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nWavel,nXtrack,nTimes
   Range or Valids:         Range is 0.0 to 1.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "Surface Albedo"
   Unique Field Definition:  OMI-Specific
   Description: >

    The surface albedo associated with the ground pixel.

 - Field Name:              UVAerosolIndex
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nXtrack,nTimes
   Range or Valids:         Range is -10.0 to 30.0
   Missing Value:           -1.2676506e+30
   Offset:                  0.0d+00
   Scale Factor:            1.0d+00
   Units:                   NoUnits
   Data Source:             PGE
   Title:                   "UV Aerosol Index"
   Unique Field Definition:  OMI-Specific
   Description: >

    The UV aerosol index associated with the ground pixel.

 - Field Name:              AIRSL3COvalue
   Data Type:               HE5T_NATIVE_FLOAT
   Dimensions:              nXtrack,nTimes
```

```
    Range or Valids:         Range is 0.0 to 10.0e+18
    Missing Value:           -9999.0
    Offset:                  0.0d+00
    Scale Factor:            1.0d+00
    Units:                   molecules/cm2
    Data Source:             PGE
    Title:                   "AIRS L3 CO"
    Unique Field Definition: OMI-Specific
    Description: >

       The AIRS Carbon Monoxide value associated with the ground pixel.

Core Metadata:

 - Metadata Name:        AssociatedInstrumentShortName
   Mandatory:           T
   Data Type:           VA20
   Number of Values:    1
   Range or Valids:     Valid is "OMI"
   Data Source:         MCF
   Description:         Actual is "OMI"

 - Metadata Name:        AssociatedPlatformShortName
   Mandatory:           T
   Data Type:           VA20
   Number of Values:    1
   Range or Valids:     Valid is "Aura"
   Data Source:         MCF
   Description:         Actual is "Aura"

 - Metadata Name:        AssociatedSensorShortName
   Mandatory:           T
   Data Type:           VA20
   Number of Values:    1
   Range or Valids:     Valids are "CCD Ultra Violet" and "CCD Visible"
   Data Source:         MCF
   Description:         Actual is "CCD Ultra Violet"

 - Metadata Name:        AutomaticQualityFlag
   Mandatory:           T
   Data Type:           VA64
   Number of Values:    1
   Range or Valids:     Valids are "Passed", "Suspect" and "Failed"
   Data Source:         PGE
   Description: >

      A granule-level quality flag that applies generally to the granule
      and specifically to the parameters at the granule level.

 - Metadata Name:        AutomaticQualityFlagExplanation
   Mandatory:           T
   Data Type:           VA255
   Number of Values:    1
   Range or Valids:     Not applicable (free format)
```

```
   Data Source:       PGE
   Description: >

      The AutomaticQualityFlag is set to
      1) "Passed" if QAPercentHighQualityData >= 90%,
      2) "Suspect" if QAPercentHightQualityData >= 60% or if the input L1B
          file does not have its AutomaticQualityFlag set to "Passed", and
      3) "Failed" if QAPercentHighQualityData < 60%.

 - Metadata Name:      DayNightFlag
   Mandatory:          T
   Data Type:          VA5
   Number of Values:   1
   Range or Valids:    Valids are "Day", "Night" and "Both"
   Data Source:        MCF
   Description:        Actual is "Day"

 - Metadata Name:      EquatorCrossingDate
   Mandatory:          T
   Data Type:          D
   Number of Values:   1
   Range or Valids:    Range is "2003-01-01" to "2099-12-31"
   Data Source:        L1B
   Description: >

      The date of the ascending equator crossing in the granule.

 - Metadata Name:      EquatorCrossingLongitude
   Mandatory:          T
   Data Type:          LF
   Number of Values:   1
   Range or Valids:    Range is -1.79d-02 to 1.80d+02
   Data Source:        L1B
   Description: >

      The terrestrial longitude of the ascending equator crossing in the
      granule.

 - Metadata Name:      EquatorCrossingTime
   Mandatory:          T
   Data Type:          T
   Number of Values:   1
   Range or Valids:    Range is "01:00:0.000000" to "01:59:59.999999"
   Data Source:        L1B
   Description: >

      The time of the ascending equator crossing in the granule.

 - Metadata Name:      InputPointer
   Mandatory:          T
   Data Type:          VA255
   Number of Values:   0 to 10
   Range or Valids: >
```

Valid file names, each in double quotes, separated by commas, all
      surrounded by curved brackets.

    Data Source: PGE
    Description: >

      Example is
      ("OMI-Aura_L1-OML1BRUG_2002m0630t2354-o21434_v001-
2003m0327t181402.he4",
      "OMI-Aura_L1-OML1BRVG_2002m0630t2354-o21434_v001-
2003m0327t181812.he4",
      "OMI-Aura_L1-OML1BIRR_2002m0630t2354-o21434_v001-
2003m0327t181812.he4",
      "radiance_AERO_p06.dat", "radiance_AERO_p10.dat",
"sbar_AERO_p06.dat",
      "sbar_AERO_p10.dat", "Sfcalb_340_TOMS_clm.dat",
"Sfcalb_380_TOMS_clm.dat",
      "Sfcalb_470_Modis_clm.dat", "transmittance_AERO_p06.dat",
      "transmittance_AERO_p10.dat", "Zaer_clm.dat").

  - Metadata Name: LocalGranuleID
    Mandatory: T
    Data Type: VA80
    Number of Values: 1
    Range or Valids: >

      "OMI-Aura_L1-OMAERUV_2003m0101t0000-o00000_v001-
2003m0101t000000.he5" to
      "OMI-Aura_L1-OMAERUV_2099m1231t2359-o99999_v999-
2099m1231t235959.he5"

    Data Source: PGE
    Description: >

      Example is
      "OMI-Aura_L1-OMAERUV_2002m0630t2354-o21434_v001-
2003m0515t181917.he5"
      (see Appendix E of Reference 3).

  - Metadata Name: OperationalQualityFlag
    Mandatory: T
    Data Type: VA20
    Number of Values: 1
    Range or Valids: >

      Valids are "Passed", "Failed", "Being Investigated", "Not
Investigated",
      "Inferred Passed", "Inferred Failed" and "Suspect".

    Data Source: PGE
    Description: >

      A granule-level quality flag that applies generally to the granule
and

specifically to the parameters at the granule level.

- Metadata Name: OperationalQualityFlagExplanation
  Mandatory: T
  Data Type: VA255
  Number of Values: 1
  Range or Valids: Not applicable (free format)
  Data Source: PGE
  Description: >

    The criteria for setting the OperationalQualityFlag should be stated
    here (this Metadata will not appear in the granule).

- Metadata Name: OperationMode
  Mandatory: T
  Data Type: VA20
  Number of Values: 1
  Range or Valids: >

    Valids are "Calibration", "Diagnostic", "Initialization", "Launch",
    "Normal", "Roll", "Routine", "Safe", "Solar Calibration", "Standby",
    "Survival" and "Test".

  Data Source: PCF
  Description: Actual is "Normal"

- Metadata Name: OrbitNumber
  Mandatory: T
  Data Type: I
  Number of Values: 1
  Range or Valids: 1 to 999999
  Data Source: L1B
  Description: The OMI orbit number

- Metadata Name: ParameterName
  Mandatory: T
  Data Type: VA40
  Number of Values: 1
  Range or Valids: Valid is "OMAERUV"
  Data Source: PGE
  Description: >

    The measured science parameter expressed in the granule.

- Metadata Name: PGEVersion
  Mandatory: T
  Data Type: VA10
  Number of Values: 1
  Range or Valids: Range is "0.0.0" to "9.9.99"
  Data Source: PCF
  Description: Example is "0.9.22" (see Appendix K of Reference 3)

- Metadata Name: ProductionDateTime
  Mandatory: T

```
   Data Type:          DT
   Number of Values:  1
   Range or Valids: >

      "2003-01-01T00:00:00.000Z" to "2099-12-31T24:59:59.999Z"

   Data Source:        TK
   Description:        The date and time of the Level 2 processing

 - Metadata Name:      QAPercentCloudCover
   Mandatory:          T
   Data Type:          I
   Number of Values:  1
   Range or Valids:   0 to 100
   Data Source:        PGE
   Description: >

      The percent of the data in the granule that have cloud cover.

 - Metadata Name:      QAPercentMissingData
   Mandatory:          T
   Data Type:          I
   Number of Values:  1
   Range or Valids:   0 to 100
   Data Source:        PGE
   Description: >

      The percent of the data in the granule that are missing.

 - Metadata Name:      QAPercentOutofBoundsData
   Mandatory:          T
   Data Type:          I
   Number of Values:  1
   Range or Valids:   0 to 100
   Data Source:        PGE
   Description: >

      The percent of the data in the granule that are out of bounds data.

 - Metadata Name:      RangeBeginningDate
   Mandatory:          T
   Data Type:          D
   Number of Values:  1
   Range or Valids:   Range is "2003-01-01" to "2099-12-31"
   Data Source:        L1B
   Description:        The year, month and day when the granule began

 - Metadata Name:      RangeBeginningTime
   Mandatory:          T
   Data Type:          T
   Number of Values:  1
   Range or Valids:   Range is "00:00:00.000000" to "23:59:59.999999"
   Data Source:        L1B
   Description: >
```

```
        The hour, minute, second and fraction of a second when the granule
        began.

 - Metadata Name:      RangeEndingDate
   Mandatory:          T
   Data Type:          D
   Number of Values:   1
   Range or Valids:    2003-01-01" to "2099-12-31"
   Data Source:        L1B
   Description:        The year, month and day when the granule ended

 - Metadata Name:      RangeEndingTime
   Mandatory:          T
   Data Type:          T
   Number of Values:   1
   Range or Valids:    Range is "00:00:00.000000" to "23:59:59.999999"
   Data Source:        L1B
   Description: >

      The hour, minute, second and fraction of a second when the granule
      ended.

 - Metadata Name:      ReprocessingActual
   Mandatory:          T
   Data Type:          VA20
   Number of Values:   1
   Range or Valids: >

      Valids are "processed 1 time", "processed 2 times", etc...

   Data Source:        PCF
   Description: >

      An indication of what reprocessing has been performed on the
granule.

 - Metadata Name:      ReprocessingPlanned
   Mandatory:          T
   Data Type:          VA45
   Number of Values:   1
   Range or Valids: >

      Valids are "no further update anticipated", "further update
anticipated"
      and "further update anticipated using enhanced PGE"

   Data Source:        DP
   Description:        Actual is "further update is anticipated"

 - Metadata Name:      ScienceQualityFlag
   Mandatory:          T
   Data Type:          VA20
   Number of Values:   1
```

```
    Range or Valids: >

       Valids are "Passed", "Failed", "Being Investigated", "Not
    Investigated",
       "Inferred Passed", "Inferred Failed" and "Suspect".

    Data Source:        DP
    Description:        Actual is "Not Investigated"

  - Metadata Name:      ScienceQualityFlagExplanation
    Mandatory:          T
    Data Type:          VA255
    Number of Values:   1
    Range or Valids:    Not applicable (free format)
    Data Source:        DP
    Description: >

       An explanation of the criteria used to set the science quality flag
       should go here.

  - Metadata Name:      ShortName
    Mandatory:          T
    Data Type:          VA8
    Number of Values:   1
    Range or Valids:    Valid is "OMAERUV"
    Data Source:        MCF
    Description:        Actual is "OMAERUV"

  - Metadata Name:      SizeMBECSDataGranule
    Mandatory:          F
    Data Type:          LF
    Number of Values:   1
    Range or Valids:    0.00d+00 to 1.00d+04
    Data Source:        DSS
    Description: >

       The volume of data contained in the granule in Mb (this Metadata
    will
       not appear in the granule).

  - Metadata Name:      VersionID
    Mandatory:          T
    Data Type:          SI
    Number of Values:   1
    Range or Valids:    000 to 999
    Data Source:        MCF
    Description:        Actual is 000 for test and pre-launch

Product Specific Attributes:

  - Metadata Name:      EndBlockNr
    Mandatory:          T
    Data Type:          SI
    Number of Values:   1 to 500
```

```
  Range or Valids:    1 to 50
  Data Source:        L1B
  Description:        The number of the NOSE end block along the track

- Metadata Name:      ExpeditedData
  Mandatory:          T
  Data Type:          VA10
  Number of Values:   1
  Range or Valids:    Valids are "TRUE" and "FALSE"
  Data Source:        L1B
  Description:        The indicator for expedited L0 data

- Metadata Name:      ExposureTimes
  Mandatory:          T
  Data Type:          F
  Number of Values:   1 to 256
  Range or Valids:    0.0 to 2000.0
  Data Source:        L1B
  Description: >

    An array containing the exposure times in seconds used for the
    measurements.

- Metadata Name:      InstrumentConfigurationIDs
  Mandatory:          T
  Data Type:          SI
  Number of Values:   1 to 256
  Range or Valids:    0 to 255
  Data Source:        L1B
  Description: >

    An array containing the instrument configuration identifiers used
    for the measurements.

- Metadata Name:      MasterClockPeriods
  Mandatory:          T
  Data Type:          F
  Number of Values:   1 to 128
  Range or Valids:    0.0 to 10.0
  Data Source:        L1B
  Description: >

    An array containing the master clock periods in seconds used for
    the measurements.

- Metadata Name:      NrMeasurements
  Mandatory:          T
  Data Type:          I
  Number of Values:   1
  Range or Valids:    0 to 9999
  Data Source:        L1B
  Description: >

    The number of measurements in the granule (per output product).
```

```
- Metadata Name:       NrSpatialZoom
  Mandatory:           T
  Data Type:           I
  Number of Values: 1
  Range or Valids:     0 to 9999
  Data Source:         L1B
  Description:         The number of measurements in spatial zoom mode

- Metadata Name:       NrSpectralZoom
  Mandatory:           T
  Data Type:           I
  Number of Values: 1
  Range or Valids:     0 to 9999
  Data Source:         L1B
  Description:         The number of measurements in spectral zoom mode

- Metadata Name:       NrZoom
  Mandatory:           T
  Data Type:           I
  Number of Values: 1
  Range or Valids:     0 to 9999
  Data Source:         L1B
  Description:         The number of measurements in zoom modes

- Metadata Name:       PathNr
  Mandatory:           T
  Data Type:           I
  Number of Values: 1 to 500
  Range or Valids:     1 to 466
  Data Source:         L1B
  Description:         Number of the NOSE path within the repeat cycle

- Metadata Name:       SolarEclipse
  Mandatory:           T
  Data Type:           VA10
  Number of Values: 1
  Range or Valids:   Valids are "TRUE" and "FALSE"
  Data Source:         L1B
  Description: >

    The indicator that during part of the measurements a solar eclipse
    occurred.

- Metadata Name:       SouthAtlanticAnomalyCrossing
  Mandatory:           T
  Data Type:           VA10
  Number of Values: 1
  Range or Valids:   Valids are "TRUE" and "FALSE"
  Data Source:         L1B
  Description: >

    The indicator that during part of the measurements the spacecraft
    was in the SAA.
```

```
 - Metadata Name:      SpacecraftManeuverFlag
   Mandatory:          T
   Data Type:          VA10
   Number of Values:   1
   Range or Valids:    Valids are "TRUE", "FALSE" and "UNKNOWN"
   Data Source:        L1B
   Description: >

      The indicator that during part of the measurements the spacecraft
      was performing a maneuver.

 - Metadata Name:      StartBlockNr
   Mandatory:          T
   Data Type:          SI
   Number of Values:   1 to 500
   Range or Valids:    1 to 50
   Data Source:        L1B
   Description:        Number of the NOSE start block along the track

Archived Metadata:

 - Metadata Name:      ESDTDescriptorRevision
   Mandatory:          T
   Data Type:          VA20
   Number of Values:   1
   Range or Valids:    Range is "0.0.0" to "9.9.99"
   Data Source:        MCF
   Description: >
      The version of the ESDT descriptor file as determined by ECS.

 - Metadata Name:      LongName
   Mandatory:          T
   Data Type:          VA80
   Number of Values:   1
   Range or Valids: >
      OMI/Aura Near UV Aerosol Optical Depth and Single Scattering Albedo
1-Orbit L2 Swath 13x24km
   Data Source:        MCF
   Description: >
      Actual is
      "OMI/Aura Near UV Aerosol Optical Depth and Single Scattering Albedo
1-Orbit L2 Swath 13x24km"

   References: >

      1. "OMI Algorithm Theoretical Basis Document, Volume III, Clouds,
Aerosols, and Surface Irradiance."
         (OMI-ATBD-VOL3, ATBD-OMI-03, Version 2.0, August 2002)

      2. "HDF-EOS Aura File Format Guidelines"
         (OMI-AURA-DATA-GUIDE, Version 2.12, 24 October 2006)

      3. "OMI Science Software Delivery Guide for Version 0.9"
```

(OMI-SSDG-0.9.10, Version 0.9.10, 22 June 2005)

4. "OMI GDPS Input/Output Data Specification (IODS) Volume 2"
   (OMI-GDPS-IODS-2, SD-OMIE-7200-DS-467, 8 November 2004)

5. "Release 6A Implementation Earth Science Data Model for the ECS
Project"
   (420-TP-022-002, June 2001)
   (http://edhs1.gsfc.nasa.gov/waisdata/rel6/html/tp4202202.html and
    http://edhs1.gsfc.nasa.gov/waisdata/rel6/html/tp42022_adds.html)