

OMI slit function

=====

version 1.0
October 2014

Introduction

This package contains the Instrument Spectral Response Function (ISRF) or the slit function of the Ozone Monitoring Instrument (OMI).

The slit function depends on wavelength and viewing angle and is given separately for two wavelength bands of OMI:

UV2 = 310 - 380 nm
VIS = 350 - 500 nm

To account for the viewing angle dependency, the slit function is given separately for each of the 60 detector rows (00, 01, ..., 59), with the following filename convention:

BND-bind/row_NN_omi_BND_slit.dat

where BND specifies the band ('uv2' or 'vis') and NN the row number.

If the viewing angle dependency of the slit function is not needed to be or cannot be taken into account, an average slit function can be used. This average is computed from the slit functions rows 12 through 47, and can be considered representative for most rows; for the 4 or 5 rows on either side of the detector the average may be less representative. Filename convention for the average slit function:

BND-bind/row_12-47_omi_BND_slit.dat

Each data file gives the wavelength dependent slit function. The slit function value is given for a set of nominal wavelengths, in steps of 5 nm over the range of the spectral band. For each nominal wavelength, the slit function is given over an interval of -1.50 nm to +1.49 nm in steps of 0.01, i.e. with a total of 300 data points. To find the slit function at other nominal wavelengths, linear interpolation between two given nominal wavelengths should be used.

Note that the slit function has not been normalised: the integral over the slit function is not equal to one. This means that when convolving spectra, one has to divide by the the integral over the slit function.

The header of each data file provides further details on the data format.

Data source

The slit function data is derived from the parametrisation described in RP-OMIE-KNMI-704:

"Parameterization of the OMI spectral slitfunction & comparison to in-flight solar irradiance data,"
issue 6 of 17 August 2005, KNMI, De Bilt

See also:

Dirksen, R., Dobber, M.R., Voors, R. and Levelt, P.: 2006,
"Pre-launch characterization of the Ozone Monitoring Instrument
transfer function in the spectral domain,"
Applied Optics, vol. 45, no. 17, 3972-3981,
doi:10.1364/AO.45.003972

The average slit function is introduced in:

Van Geffen, J.H.G.M., Boersma, K.F., Van Roozendaal, M., Hendrick, F.,
Mahieu, E., De Smedt, I., Sneep M. and Veefkind, J.P.: 2015,
"Improved spectral fitting of nitrogen dioxide from OMI in the
405 -- 465 nm window,"
Atmos. Meas. Techn., vol 8, 1685-1699,
doi:10.5194/amt-8-1685-2015

Version history

0.9 -- 09 Sep. 2014 -- Initial assembly of package for internal evaluation
1.0 -- 16 Oct. 2014 -- First official release of package

Package credits

(c) 2014 -- KNMI, De Bilt, The Netherlands
[https://www.knmiprojects.nl/projects/ozone-monitoring-instrument/
data-products/omsplit](https://www.knmiprojects.nl/projects/ozone-monitoring-instrument/data-products/omsplit)

Data set made by Albert Oude Nijhuis.
File header updated by Jos van Geffen.
Average slit function by Jos van Geffen.

Package compiled by Jos van Geffen.
Thanks to Maarten Sneep & Quintus Kleipool.