

ENVISAT Post-Launch Products

GOMOS

1. Product Summary

The following table lists all files included in the sample test data-set. The first group of files are the common auxiliary files (calibration database, star catalogue etc.) and the level 1b/2 products files. There are five groups of products files, one for each occultation.

Filenames	PDS Name	Conceptual name
Common files		
L1b/AX/GOM_CAL_AXNACR20020717_193500_20020717_193500_20100101_000000	GOM_CAL_AX	On-ground calibration database
L2/AX/GOM_CRS_AXNACR20020531_190000_20020301_000000_20100101_000000	GOM_CRS_AX	Cross section and transmission database
L1b/AX/GOM_CAT_AXNACR19991125_100000_19991125_100000_20100101_000000	GOM_CAT_AX	Star catalogue
AX/GOM_INS_AXNACR20020724_140000_20020301_000000_20100101_000000	GOM_INS_AX	On-ground characterisation database
L1b/AX/GOM_PR1_AXNACR20020501_140000_20020301_000000_20100101_000000	GOM_PR1_AX	Configuration parameter level 1b database
L2/AX/GOM_PR2_AXNACR20020724_190000_20020301_000000_20100101_000000	GOM_PR2_AX	Configuration parameter level 2 database
L1b/AX/GOM_STS_AXNACR19991125_160000_19991125_160000_20100101_000000	GOM_STS_AX	Stellar spectra database
Occultation product files		
L0/GOM_NL_0PNPDK20020729_151703_000059552008_00097_02155_0730.N1	GOM_NL_0P	Instrument source packets
L1b/GOM_LIM_1PNACR20020729_153950_000000362008_00097_02155_0001.N1	GOM_LIM_1P	Geolocated calibrated background/limb spectra
L1b/GOM_TRA_1PNACR20020729_153950_000000362008_00097_02155_0001.N1	GOM_TRA_1P	Geolocated calibrated transmission spectra and fast photometer fluxes
L2/GOM_EXT_2PNACR20020729_162402_000000512008_00097_02155_0001.N1	GOM_EXT_2P	Residual extinction data
L2/GOM_NL_2PNACR20020729_153950_000000362008_00097_02155_0001.N1	GOM_NL_2P	Atmospheric constituents and temperatures profiles
L1b/GOM_LIM_1PNACR20020729_162402_000000512008_00097_02155_0001.N1	GOM_LIM_1P	Geolocated calibrated background/limb spectra
L1b/GOM_TRA_1PNACR20020729_162402_000000512008_00097_02155_0001.N1	GOM_TRA_1P	Geolocated calibrated transmission spectra



729_162402_000000512008_000 97_02155_0001.N1		and fast photometer fluxes
L2/GOM_NL_2PNACR200207 29_162402_000000512008_0009 7_02155_0001.N1	GOM_NL_2P	Atmospheric constituents and temperatures profiles
L2/GOM_RR_2PNACR200207 29_153950_000000362008_0009 7_02155_0001.N1	GOM_RR_2P	Extracted atmospheric profiles for meteo users (O ₃ , NO ₂ , NO ₃ , Air, O ₂ , H ₂ O, OCIO) and geolocation data
L2/GOM_RR_2PNACR200207 29_162402_000000512008_0009 7_02155_0001.N1	GOM_RR_2P	Extracted atmospheric profiles for meteo users (O ₃ , NO ₂ , NO ₃ , Air, O ₂ , H ₂ O, OCIO) and geolocation data

The algorithm resulting in the product files are described in short “GOMOS Level 1b/2 Algorithm Description document for EnviView pre-release” PO-TN-ESA-GM-1019.

5.1 Product Summary

The Global Ozone Monitoring by Occultation of Stars (GOMOS) instrument on ENVISAT is a limb sounding spectrometer designed primarily to simultaneously measure vertical profiles of trace gases, temperature and humidity in the stratosphere. The GOMOS instrument is designed for dark limb operation, but also offers measurement capability in bright limb. Atmospheric constituents are retrieved by spectral analysis of the transmission products from the spectral bands between 250 nm to 675 nm (UV and VIS bands), 756 nm to 773 nm, and 926 nm to 952 nm (IR-1 and IR-2 bands). Additionally, two photometers are operating in two spectral channels; between 470 nm to 520 nm and 650 nm to 700 nm, respectively.

5.1.1 GOMOS Level 1b Products

There are two GOMOS level 1B products: the Geolocated Calibrated Transmission Spectra Product, and the Geolocated Calibrated Background Spectra Product.

Geolocated and Calibrated Transmission Spectra Product

This is the engineering foundation product for the GOMOS sensor. It contains the calibrated data, a copy or a reference to the auxiliary data, the datation of the measurements and of the processing, and the product confidence indicators at product and data level. It also includes auxiliary data needed for high level processing. The product is processed systematically and consists of data corresponding to a single occultation. The NRT version of the product is available 3 hours after acquisition and the fully consolidated version 2 weeks.

Name	Geolocated and Calibrated Transmission Spectra
Product ID	GOM_TRA_1P
Description	Localised calibrated transmission spectra and photometer fluxes. It contains full transmission spectra, central background spectra, and photometers engineering data.
Applications	This product is the main Level 1B product. It is the basis for further Level 2 processing.



Delivery Time	NRT: 3 hours after acquisition Fully consolidated: 2 weeks after acquisition
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Throughput	1 product per occultation, up to 85 occultations per orbit (typical 45)
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Product Size	typically 3-4 MB/occultation (max. 20 MB/occultation)
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Geometric Sampling	Elevation Range: 62 to 68 degrees corresponding to 15-100 km Azimuth Range: -10 to +90 degrees (anti flight direction)
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Geometric Resolution	1.7 km vertical sampling resolution
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Geometric Accuracy	Atmospheric altitude restitution accuracy: 50m
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Spectral Resolution	Spectrometer UV/VIS: 0.72 nm / 0.89 nm, 0.314 nm / 0.312 nm sampling interval Spectrometer IR1/IR2: 0.12 nm / 0.14 nm, 0.0465 / 0.0571 nm sampling interval
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Relative Spectral Accuracy	Spectrometer UV/VIS: 0.17 nm / 0.20 nm Spectrometer IR1/IR2: 0.005 nm / 0.06 nm Wavelength stability between any two occultations (dark limb)
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Auxiliary Data Used	Stellar spectra, calibration database, , instrument physical characteristics data, star catalogue level 1B processing configuration database, ENVISAT orbit state vectors and attitude data, geopotential and temperature (ID 129 and 130) from ECMWF.
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Algorithms Used	Source packet data extraction, star catalogue extraction, datation, wavelength assignment, geolocation processing (using ECMWF data), geometric and radiometric correction and calibration
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Notes	Produced systematically from nominal mode level 0 data. The spectral stability values is worst case, assuming no calibration correction.
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Geolocated and Calibrated Background Spectra (Limb) Product

This product contains a reference to the Level 0 product, measured upper and lower background spectra, a copy or a reference to the auxiliary data used to generate the product, datation of the measurement and of the processing, and product confidence indicators at product and data level. This product is produced systematically and consists of data corresponding to a single occultation. Its primary application is for calibration and validation of the instrument. The NRT version of the product is available 3 hours after acquisition and the fully consolidated version 2 weeks.



Name	Geolocated and Calibrated Background (Limb) Spectra
Product ID	GOM_LIM_1P
Description	Localised calibrated upper and lower background (flat field corrected, with and without straylight)
Applications	This product is used for instrument validation and calibration.
Delivery Time	NRT: 3 hours after acquisition Fully consolidated: 2 weeks after acquisition
Throughput	1 product per occultation, up to 50 occultations per orbit
Product Size	typically 2 MB/occultation (max. 13 MB/occultation)
Geometric Sampling	Elevation Range: 62 to 68 deg corresponding to 15-100 km Azimuth Range: -10 to +90 deg (anti flight direction)
Geometric Resolution	1.7 km vertical sampling resolution
Geometric Accuracy	Atmospheric altitude restitution accuracy: 50m
Spectral Resolution	Spectrometer UV/VIS: 3.14 nm / 3.12 nm, 0.314 nm / 0.312 nm sampling interval Spectrometer IR1/IR2: 0.465 nm / 0.571 nm, 0.0465 / 0.0571 nm sampling interval Spectral resolution in bright limb is equal to with of slit (200 micron) = 10 pixels on CCD
Relative Spectral Accuracy	Spectrometer UV/VIS: 0.17 nm / 0.20 nm Spectrometer IR1/IR2: 0.005 nm / 0.06 nm Wavelength stability between any two occultations (dark limb)
Auxiliary Data Used	stellar spectra, calibration database, star catalogue, instrument physical characteristics data, level 1B processing configuration database, orbit state vectors, ECMWF data
Algorithms Used	source packet data extraction, star catalogue extraction, datation, wavelength assignment, geolocation processing, geometric and radiometric correction and calibration
Notes	produced systematically from nominal mode level 0 data

5.1.2 GOMOS Level 2 Products

There are three Level 2 GOMOS products: The GOMOS Temperature and Atmospheric Constituents Profiles product, the Residual Extinction product, and the Extracted Profiles for Meteo Users product. All level 2 products contain data for an individual occultation.

Temperature and Atmospheric Constituents Profiles Product

This product is generated systematically and contains vertical profiles of atmospheric parameters such as temperature and turbulence, along with gas concentrations and aerosols for a single occultation. The NRT version of the product is available 3 hours and the fully consolidated version 2 weeks after acquisition.

Name	GOMOS Temperature and Atmospheric Constituents Profiles
Product ID	GOM_NL_2P
Description	Atmospheric constituents profiles: vertical and line density profiles of ozone, NO ₂ , NO ₃ , O ₂ , H ₂ O, air, aerosols, temperature, turbulence
Applications	This product is used for Meteorology and Climatology.
Delivery Time	NRT: 3 hours after acquisition Fully consolidated: 2 weeks after acquisition
Throughput	1 product per occultation, up to 50 occultations per orbit
Product Size	up to 0.5 MB/occultation
Geometric Sampling	Elevation Range: 62 to 68 deg corresponding to 15-100 km Azimuth Range: -10 to +90 deg (anti flight direction)
Geometric Resolution	1.7 km vertical sampling resolution
Auxiliary data Used	cross section database, instrument physical characteristics data, Level 2 processing configuration database
Algorithms Used	scintillation/dilution/chromatic refraction correction, spectral inversion, smoothing, vertical inversion, quality check
Notes	produced systematically from geolocated and calibrated transmission spectra product

Extracted Profiles for Meteo Users

The product contains selected vertical profiles extracted from the NRT GOMOS Temperature and Atmospheric Constituents Profiles product for NRT distribution to Meteo users. It is produced systematically and is available within 3 hours from the PDHS. The primary application of this product is NRT global atmospheric modelling and monitoring.

Name	GOMOS Extracted Profiles for Meteo Users
Product ID	GOM_RR__2P
Description	Atmospheric constituents profiles: vertical profiles of ozone, NO ₂ , NO ₃ , O ₂ , H ₂ O, air, temperature
Applications	This product is used for Meteorology.
Delivery Time	NRT: 3 hours after acquisition Fully consolidated: 2 weeks after acquisition
Throughput	1 product per occultation, up to 50 occultations per orbit
Product Size	up to 0.064 MB/occultation
Geometric Sampling	Elevation Range: 62 to 68 deg corresponding to 15-100 km Azimuth Range: -10 to +90 deg (anti flight direction)
Geometric Resolution	1.7 km vertical sampling resolution
Auxiliary data Used	cross section database, instrument physical characteristics data, Level 2 processing configuration database
Algorithms Used	scintillation/dilution/chromatic refraction correction, spectral inversion, smoothing, vertical inversion, quality check (Same as for GOM_NL__2P products)
Notes	produced systematically from geolocated and calibrated transmission spectra product

5.3 Source of Data Products

Level 0, 1b, 2 and Auxiliary products are provided. The auxiliary products are the last updates made at end of July.

As the output products are created using the GOPR prototype processor, not the PDS Production system.



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The observed data contains occultations of the Sirius star during absolute orbit 2155 (29/07/2002 at 16:24:02) from 133 down to 6 km.

5.4 Foreseen evolutions of the products

No changes are foreseen before the launch of ENVISAT.

The algorithms used in the product files are described in short in the GOMOS Product Handbook.