

The ENVISAT-ESA Atmospheric-Chemistry dataset: operational data availability and re-processing status

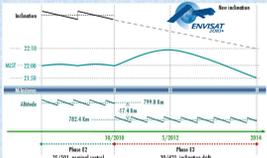
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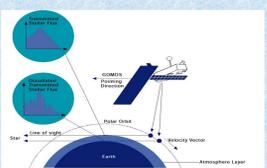
ENVISAT Atmo-Chem missions



Satellite characteristics	Launched in Mar 2002 in a sun-synchronous polar orbit with controlled altitude and MLST in the range 22:00 +/- 5min
Performances	All platform modules and payload performances are excellent.
Mission extension	The satellite altitude was successfully lowered by 17.4 km during 22-26 Oct 2010. The orbit inclination will not be maintained, resulting in a drifting MLST (10min), allowing to extend the lifetime to mid 2014.

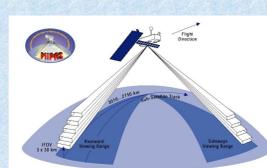
ENVISAT Atmo-Chem data	Limb products (with validated altitude range)													Nadir products								
	Press	Temp	H ₂ O	O ₃	HNO ₃	CH ₄	N ₂ O	NO ₂	NO _x	BrO	O ₂	Clouds	Aerosol	O ₃	NO ₂	BrO	SO ₂	H ₂ O	CO	OCIO	Clouds properties	
GOMOS		18-30 km	< 50 km	18-45 km				20-50 km	20-45 km		15-70 km		10-35 km									
MIPAS	18-65 km	18-65 km	18-52 km	18-52 km	17-34 km	12-40 km	12-40 km	23-50 km				Flag										
SCIAMACHY			20-40 km					20-40 km			15-27 km		Cloud Top		VCD	VCD	VCD	VCD	VCD	VCD	Slant column	CH, CO, AAI

GOMOS



Instrument type	GOMOS is a spectrometer measuring the UV, visible and near infrared atmospheric spectrum using a stellar occultation technique.
Instrument performances	Corrective actions were undertaken to cure a problem with the stellar tracking unit, today the instrument performances are excellent.
Mission extension	No showstopper were identified for the continuation of GOMOS mission until mid 2014, ENVISAT end of life.

MIPAS



Instrument type	Michelson Interferometer measuring the thermal IR emission of the atmosphere with Limb viewing geometries.
Instrument performances	The instrument performances are excellent in the OR mission scenario. The anomaly in the Interferometer is under control.
Mission extension	No showstopper were identified for the continuation of MIPAS mission until mid 2014, ENVISAT end of life.

SCIAMACHY



Instrument type	SCIAMACHY is a spectrometer observing backscattered, reflected, transmitted or emitted radiation from the atmosphere in three viewing geometries: nadir, limb, and sun/moon occultation.
Instrument performances	Instrument performances are excellent.
Mission extension	No specific showstoppers are expected for the continuation of the mission until ENVISAT end of life

Version 6.01 of the processor is under validation, it will be used for operations and for the 3rd re-processing campaign. IPF6.01 implements significant upgrades in the algorithm, mainly: i) the new intra-pixel PRNU allows improvement in the H2O retrieval, ii) improved HRTP profiles will be available, iii) the Full VCM will be used for the error determination.

Current processor	Processing	Availability	IPF	Dissemination method
Level 1	NRT/Off-line	NRT: 3h Off-line: 10 days	5.01	ftp (E-K)
	Re-processed	Full mission: 2002 - 2011	5.01	ftp (D-PAC)
Level 2	NRT/Off-line	NRT: 3h Off-line: 10 days	5.01	ftp (E-K)
	Re-processed	Full mission: 2002 - 2011	5.01	ftp (D-PAC)

Level 1 and Level 2 operational processing is operational NRT and off-line with processor version 5.05. The MIPAS full mission was re-processed to Level 1 and Level 2 with IPF 5.05, data are available in the D-PAC ftp server. Full mission re-processing with processor V6 (4 additional species: CFC-11, CFC-12, N2O5, ClONO2) will start 2nd Quarter of 2011.

Current processor	Processing	Availability	IPF	Dissemination method
Level 1	NRT/Off-line	NRT: 3h Off-line: 10 days	5.05	DDS ftp (E-K)
	Re-processed	Full mission: 2002 - 2011	5.05	ftp (D-PAC)
Level 2	NRT/Off-line	NRT: 3h Off-line: 10 days	5.05	ftp (E-K)
	Re-processed	Full mission: 2002 - 2011	5.05	ftp (D-PAC)

The full-mission Level 1 reprocessing with IPF 7.03/7.04 is completed and accessible on the D-PAC FTP server. The Level 2 reprocessing with processor version 5.01 has been stopped. Reprocessing will restart with the upcoming processor version 5.02 implementing improvements for SO2, CO and OCIO.

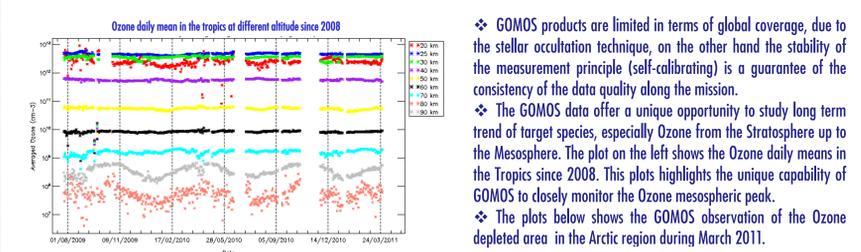
Current processor	Processing	Availability	IPF	Dissemination method
Level 1	NRT/Off-line	NRT: 3h Off-line: 10 days	7.04	DDS ftp (E-K)
	Re-processed	Full mission: 2002 - 2011	7.03/04	ftp (D-PAC)
Level 2	Fast delivery/Off-line	FD: 24h Off-line: 10 days	5.01	ftp (D-PAC)
	Re-processed	Full mission: 2002 - 2009	3.01	ftp (D-PAC)

Processing status

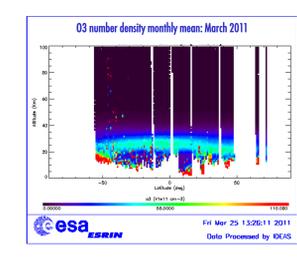
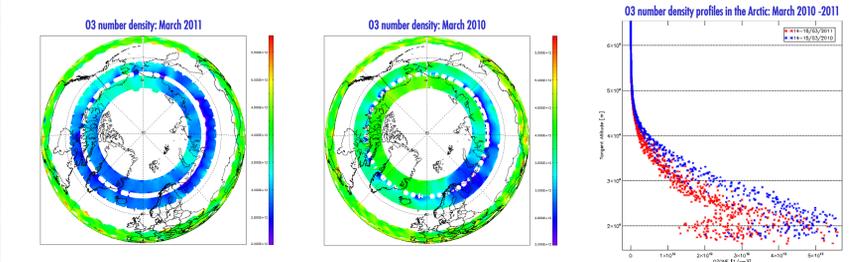
Highlights on ENVISAT-ESA Atmospheric-Chemistry dataset

Highlights on GOMOS-ESA long term archive

Long term monitoring of Ozone Mesospheric peak



- GOMOS products are limited in terms of global coverage, due to the stellar occultation technique, on the other hand the stability of the measurement principle (self-calibrating) is a guarantee of the consistency of the data quality along the mission.
- The GOMOS data offer a unique opportunity to study long term trend of target species, especially Ozone from the Stratosphere up to the Mesosphere. The plot on the left shows the Ozone daily means in the Tropics since 2008. This plot highlights the unique capability of GOMOS to closely monitor the Ozone mesospheric peak.
- The plots below show the GOMOS observation of the Ozone depleted area in the Arctic region during March 2011.

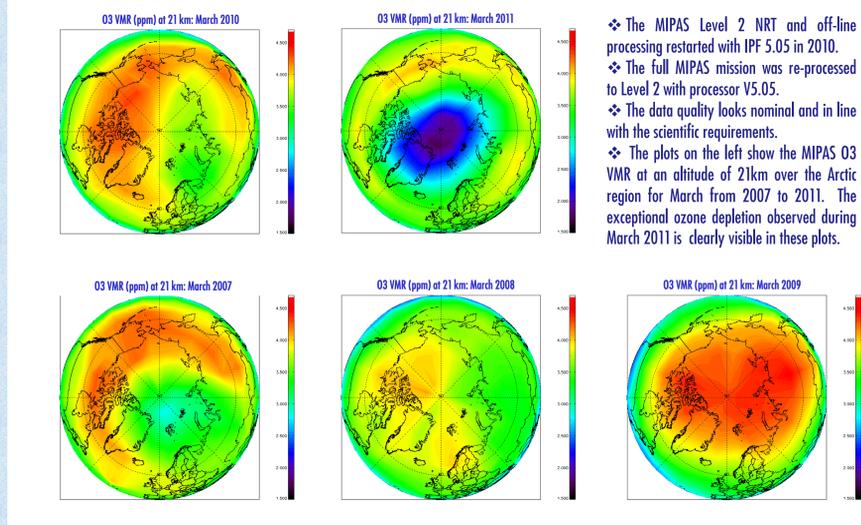


GOMOS operational ESA data

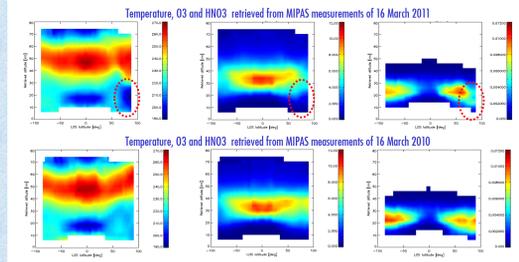
- The GOMOS operational data allows to closely monitor the state of the Earth's atmosphere, in particular the Ozone distribution on a wide vertical range, going from the lower Stratosphere up to about 100 km., allowing to detect the O3 Mesospheric peak.
- The plot on the left shows the GOMOS Ozone monthly mean for March 2011.
- The accuracy of GOMOS data is affected by the characteristics of the considered stars (e.g., star magnitude, star temperature). However, the usage of the same star along the mission allows to precisely determine long term trend, owing to the very stable instrument measurement principle (self-calibrating).

Highlights on MIPAS-ESA long term archive

Ozone VMR at 21 km in the Arctic during March from 2007 to 2011



- The MIPAS Level 2 NRT and off-line processing restarted with IPF 5.05 in 2010.
- The full MIPAS mission was re-processed to Level 2 with processor V5.05.
- The data quality looks nominal and in line with the scientific requirements.
- The plots on the left show the MIPAS O3 VMR at an altitude of 21km over the Arctic region for March from 2007 to 2011. The exceptional ozone depletion observed during March 2011 is clearly visible in these plots.

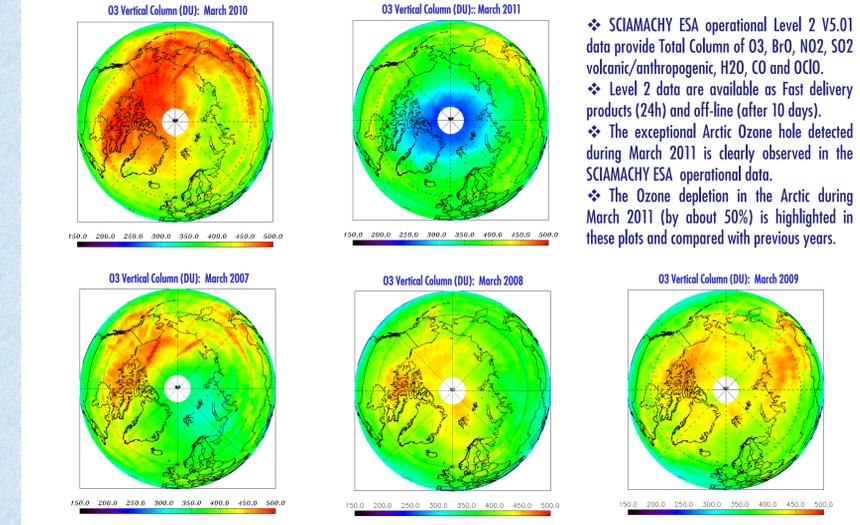


MIPAS operational ESA data

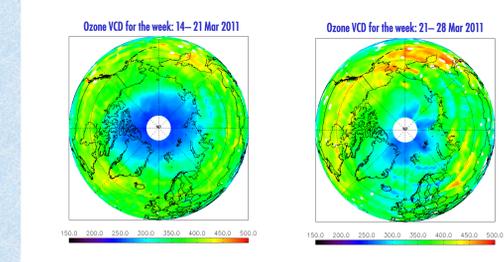
- The monitoring of the MIPAS operational data allows to follow closely the evolution of the Ozone hole in the Arctic during March 2011 and its relation with the atmospheric status (e.g., Temperature).
- The zonal mean for Temperature, O3 and HNO3 (VMR) during 16 March 2011 and for the same day of 2010 are shown in the plots on the left.
- The extremely cold temperature in the Arctic during March 2011 can be observed as the correlation of the ozone depletion area with HNO3 VMR.

Highlights on SCIAMACHY-ESA long term archive

Arctic Ozone Total column during March from 2007 to 2011



- SCIAMACHY ESA operational Level 2 V5.01 data provide Total Column of O3, BrO, NO2, SO2 volcanic/anthropogenic, H2O, CO and OCIO.
- Level 2 data are available as Fast delivery products (24h) and off-line (after 10 days).
- The exceptional Arctic Ozone hole detected during March 2011 is clearly observed in the SCIAMACHY ESA operational data.
- The Ozone depletion in the Arctic during March 2011 (by about 50%) is highlighted in these plots and compared with previous years.



SCIAMACHY operational ESA data

- The monitoring of the SCIAMACHY fast-delivery products (24h after sensing) allows to follow the evolution of the Ozone hole in the Arctic during the past two weeks.
- The evolution of the Ozone depleted area around the Arctic will be monitored with care in the coming weeks.
- Currently there are some concerns about the possible migration of Ozone depleted air masses towards high populated regions of the Northern Hemisphere.

Summary and conclusion

GOMOS

- With the extension of the ENVISAT mission until mid 2014 GOMOS dataset will cover a period of more than 12 years.
- Taking into account the stability of the GOMOS performances (self-calibrating) the GOMOS archive will represent a unique dataset for long term studies, especially for Ozone in the Stratosphere and Mesosphere.

MIPAS

- After a long interruption in the availability of MIPAS geophysical products the Level 2 operational processing was resumed in 2010.
- The full MIPAS mission was re-processed to Level 2 using the IPF 5.05 and the dataset was released to the users. The first validation results confirm the quality of the Level 2 data generated with V5.

SCIAMACHY

- The SCIAMACHY operational ESA data is a valuable tool for global and continuous monitoring of Earth's atmospheric status.
- With the upcoming activation of the processor version 5.02 the retrieval of SO2, CO and OCIO Total Column will be significantly improved. The processor 5.02 will be used for the full mission re-processing.

Source of info

Products access and info	ESA EOHelp	cesatools	Mail to: eohelp@eo.esa.int
Products calibration	SciA1c	SciA1c	http://earth.esa.int/object/index.cfm?objectId=4073
Reading tool	BeaT/VISAN	BASIC ENVISAT PROCESSING TOOLBOX	http://www.stcorp.nl/beat/
Monitoring web page	PCS web page	IDEAS	http://earth.eo.esa.int/pcs/envisat/