

DLR Data Services for GOME-2/MetOp Atmospheric Trace Gas Monitoring

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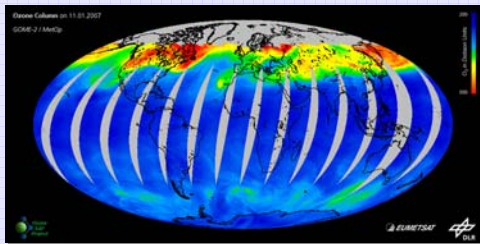
Abstract

Within the distributed EUMETSAT EPS ground segment, DLR acts as an integral part of the **Ozone and Atmospheric Chemistry Monitoring Satellite Application Facility** (O3M-SAF) for the processing, archiving and delivery of GOME-2 atmospheric products providing the total column density of different trace gases such as **O₃**, **NO₂**, **BrO**, **SO₂**, **OCIO** and **HCHO**, as well as **cloud information**. Based on the continuous reception of GOME-2 level 1B data, different processing chains are triggered for the generation and dissemination of level 2 products.

This poster introduces all data services provided by DLR in the framework of the O3M-SAF and the WDC-RSAT projects. The data services are required for geophysical product validation, systematic dissemination to institutions such as ECMWF and NWP services in near real-time, and individual data delivery to mainly scientific users. We give an overview of the deployment of the operational facility at DLR and present first operational experiences after entering the O3M-SAF continuous development and operations phase (CDOP).

Introduction

Based on the **GDP 4 algorithm**, DLR generates level 2 total column trace gas products. The processing is performed systematically in a high-available operational environment starting with MetOp-A orbit number 1986 (2007-03-08).



First Ozone Total Column Products

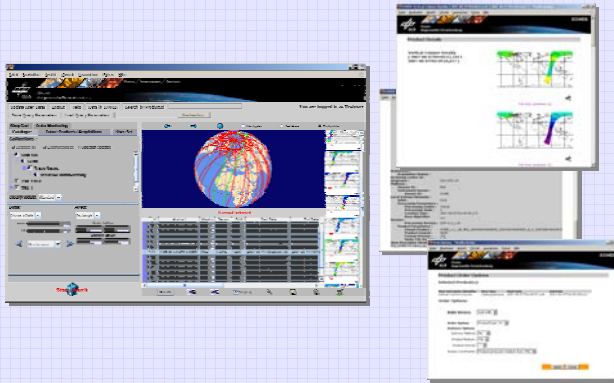
Data Services

The data services provided by DLR for GOME-2 atmospheric products include

- the direct **online delivery** of products to subscribed users in **near real-time**
- the dissemination via the **EUMETCast** system in near real-time
- the systematic publishing of level 2 and derived products in the **World Data Center for Remote Sensing of the Atmosphere** (WDC RSAT) <http://wdc.dlr.de>
- the systematic publishing of products in DLR's multi-mission web gateway **EOWEB**® <http://eoweb.dlr.de>
- the systematic upload of product information to the EUMETSAT **UMARF** catalogue (expected to become operational in October 2007)
- the **processing of orders** issued via EOWEB® and UMARF for archived products, including online delivery per FTP or offline on CD/DVD
- the processing of **subscription orders** to specific users requiring e.g. systematic deliveries of all products of the month on CD/DVD

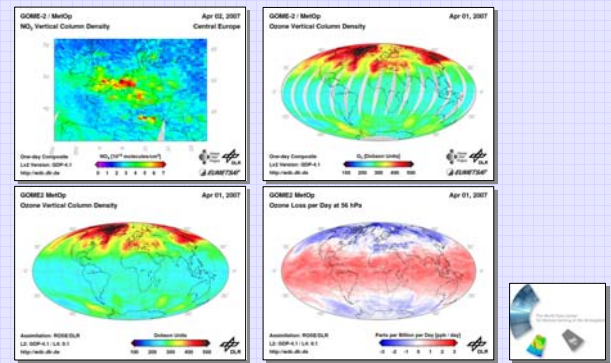
Online User Interfaces

The central online user service for SAF data products will be provided by the EUMETSAT UMARF catalogue. Additionally, DLR provides catalogue, browse and order services in its **online user service web gateway EOWEB**®.



EOWEB® Online User Service

The **World Data Center for Remote Sensing of the Atmosphere** operated by DLR provides online data access to GOME-2 value added data products, such as one-day composites, daily gridded assimilations including forecasts for O₃ vertical column density and chemical O₃ loss, in different projections.



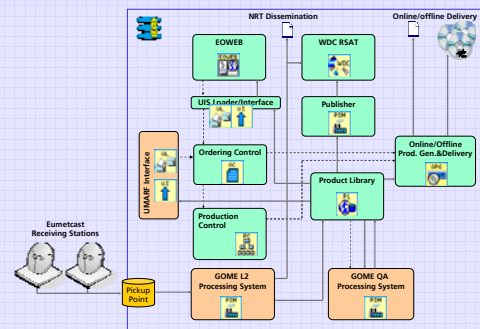
O₃ and NO₂ Vertical Column Composites and Assimilation

Data Information and Management System DIMS

The challenging requirements of the EPS ground segment for the SAF's concerning processing **throughput**, system **reliability**, guaranteed **near real-time capability**, data **consistency** and **activity traceability** are met at DLR with an integrated O3M-SAF processing and product management system implemented with DLR's Data Information and Management System DIMS. This system is operated in DLR's multi-mission earth observation ground segment facility, integrating

- two redundant EUMETCast receiving stations
- the GOME-2 processing system hosting the Universal Processor for Atmospheric Spectrometers (UPAS), running on a high-availability host cluster with fully redundant network components
- the GOME-2 quality assurance system for online product quality control
- the interface to EUMETSAT's central UMARF catalogue

The configurability of the DIMS components **Processing System Management** and **Product Library** allowed a very low effort integration of the O3M-SAF functions in the multi-mission facility, providing the standard functions of long-term archiving, online user services and product ordering and delivery.



DIMS Configuration for the O3M-SAF at DLR

Summary

During the early CDOP phase of the O3M-SAF, DLR very successfully operated the near real-time and offline processing and dissemination of GOME-2 total column products. Processing and delivery of **NRT GOME-2 PDU products takes less than 10 min**, usually being delivered within 2h and 25 min after sensing time.

The total ozone and NO₂ time series, starting in 1995 with GOME/ERS-2 and SCIAMACHY on Envisat, will be extended to 2020 with the GOME-2 instrument. The length and quality of the GOME total column data records, as based on the GDP 4 algorithm, makes them desirable for use in long-term trend monitoring.