Synergetic Operational Earth Observations with the EPS/MetOp System

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Outline

1. Introduction
2. EPS System and Observations
3. Outlook
1. Introduction
Initial Joint Polar System (IJPS)

- EUMETSAT-NOAA coordinated programmes
- Exchange of instruments (ATOVS, AVHRR from NOAA, MHS from EUMETSAT)
- Coordinated operations, data and services
- Extended agreement in 2003 to include MetOp-C

Sun-synchronous Orbit of 102 minutes
14.1 orbits per day
2. EPS System: Ground Segment

- Local mission: Real-time transmission of imaging and sounding data to local user stations
- Global mission: Delivery of global measurements to National Meteorological Services of Member and Cooperating States and NOAA within 2.25 hours of the instant of observation (GTS, EUMETCast)

EPS Services

- Direct Readout User
- IASI TEC
- Users
- 8 SAF
- Central Ground Segment
  - Global Level 1 and Level 2 products
  - Archive for all mission products (UMARF)
2. EPS System: Space segment

The MetOp satellites
Launch from the Baikonour Cosmodrome with Sojuz/Fregat the 19th October 2006
The payload supports a number of missions:

- **Atmospheric Sounding** (temperature, humidity, O\textsubscript{3}/trace gases):
  - IR/MW sounders:
    - HIRS-4/IASI, AMSU-A/MHS
  - UV/VIS sounder:
    - GOME-2
  - Radio occultation limb sounder:
    - GRAS
- **Global VIS/IR Imagery**: AVHRR/3
- **Wind vectors over the ocean**: ASCAT
- **Data location and collection**:
  - ARGOS Terminal
- **Global and local data access**:
  - solid state recorder (on board memory) /HRPT/LRPT
- **Search & Rescue Terminal**
MetOp payload: IASI
IASI Products
A Major Step Forward In Infrared Sounding

HIRS 19 channels vs IASI 8461 spectral samples
IASI provides a wealth of IR sounding information

IASI MetOp-A 15 January 2007 18:08-19:52 UTC
IASI Level 2 sounding product

Metop-A 22/10/2007 181459–200320UTC

Temperature map showing data from Metop-A on 22/10/2007.
MetOp payload: ATOVS

MHS
Microwave Humidity Sounder

HIRS/4
High Resolution Infrared Radiation Sounder

AMSU-A1
AMSU-A2
Advanced Microwave Sounding Unit
ATOVS and AVHRR Products
...the ATOVS sounders provide information

In the microwave region
- AMSU-A
- MHS

In the infrared region
- HIRS/4
MetOp payload: AVHRR/3
Advanced Very High Resolution Radiometer
Global AVHRR/3 products are available at full resolution
MetOp-A AVHRR/4 Level 1b RGB 324 05 August 2007 1010Z

...and are supported by the AVHRR Imager
MetOp payload: ASCAT
Advanced Scatterometer
3.4 ASCAT Products
The OSI-SAF is providing wind products.
MetOp payload: GOME-2
3.3 GOME-2 Products
Polarisation Measurement Device (PMD) helps monitoring
Reflectance (Greenland)
Ozone Monitoring from the O3M SAF

GOME-2 / MetOp
Ozone Vertical Column Density

Aug 05, 2007
Northern Hemisphere

One-day Composite
Lv2 Version: GDP-4.2
http://wdc.dlr.de

O$_3$ [Dobson Units]

100 200 300 400 500
Ozone Monitoring from the O3M SAF

GOME-2 / MetOp
Ozone Vertical Column Density

Aug 05, 2007
Central Europe

One-day Composite
Lv2 Version: GDP-4.2
http://wdc.dlr.de

O$_3$ [Dobson Units]

100 200 300 400 500
MetOp payload: GRAS

GNSS Receiver for Atmospheric Sounding
GRAS Level 1b product: bending angles

GRAS requirement: Max abs error < $1\mu$rd
...and the retrievals with (SF only)

Marquardt, 2007
3 Outlook
Synergetic use of data

Instrument Scan Pattern

Synergetic use of data
Insutments on the same platform...
Day-2 activities: New agreed products

Soil moisture from ASCAT

Wagner et al., 2007
Day-2 activities: New agreed products

NDVI at full resolution from AVHRR

Metop–A 01/04/2007

First IASI Conference
13 – 16 November 2007, Anglet, France
Day-2 activities: Intra calibration
IASI and HIRS

IASI Radiances + HIRS Ch8 Response = Simulated HIRS Radiance

Co-Location better than 10 km

N=110

Ackermann et al., 2007

First IASI Conference
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Thank you for your attention!

More info: www.eumetsat.int