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# Metop Status Overview

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Operational Products

- ATOVS-AVHRR Level 1
  - Metop-A service operational since 26/06/07
  - NOAA-18 service declared operational on 15/12/07
Operational Products

• IASI Level 1
  • Service operational since July 07
  • Error covariance matrices available
  • Monitoring by ECMWF, UKMO, M-F and EUMETSAT
  • Fast recovery from “heater refuse” events (<4h on 9/2/2008)
…and the campaigns reveal an excellent IASI instrument

- JAI VEx
ASCAT Cal/Val Progress

• Milestones achieved:
  – Initial external calibration campaign (12/06)
  – Start of dissemination (31/1/07)
  – Sigma-0 assimilated by ECMWF operational forecast
  – Start of ocean winds dissemination (9/5/07)
  – Refined calibration & pre-operational service (10/10/07)
  – Full external calibration with three transponders (12/07 to 16/02/08)
ASCAT Cal/Val Progress (2)

• Results from full external calibration:
  – Bias change of +0.3 dB in average
    => Close agreement with ERS-2
  – Full absolute characterisation of directional gain pattern
    with an accuracy estimated at ±0.05 dB
  – Test data with new calibration applied available 3/3/08
  – Implementation of new calibration in NRT /start of
    operational service, started on 03/04/08

• Ongoing activities:
  – Validation with rain forest, ocean, sea ice
  – Validation of product quality flags
  – Tuning of CMOD5 geophysical model function at OSI SAF
Antenna gain pattern and orientation, beam 0 (red=10/10/07 calibration, green=new external calibration)

Geometry coverage during campaign

IPY STG3 ESRIN 5 – 6 May 2008
GOME-2 Cal/Val Progress

• Milestones /Activities Achieved
  • Routine instrument and product quality monitoring, ongoing since launch;
  • Verification of spectral calibration parameters;
  • Validation of Sun Mean Reference spectrum;
  • Validation of cloud algorithm & products;
  • Verification and validation of Earthshine spectra;
  • Validation of polarisation products;
  • Re-definition and testing of on-board settings for the Polarisation Measurement Devices (PMDs) in 10/07 and 02/08;
  • Improvement of the spectral calibration of PMDs.
GOME-2 Cal/Val Progress (2)

• Last steps for operational service:
  PPF v3.9 update 10/3/08;
  On-board setting of the PMDs on 11/3/08;
  On-board s/w patches for co-adding, band 2/3 overlap anomaly correction – mid-March
GOME-2 Cal/Val Progress (3)

GOME-2 SO$_2$ (Jabal al-Tair): 2007/09/30

GOME-2 SO$_2$ provided courtesy of University of Bremen (Andreas Richter & colleagues)
Antarctica Ozone hole 2007

Aug, 01, 2007
STICKSTOFFDIOXID
über Europa
am 04.02.2007

MetOP / GOME2

$\text{NO}_2$ in Billionen Molekülen pro Quadratzentimeter

1 Brd. ($10^9$)
5 Brd. ($5\times10^9$)

Ozone
SAF
Project

EUMETSAT

DLR
First GOME-2 Nitrogen Dioxide Total Column (2)
GRAS Cal/Val Progress

• Milestones /Activities Achieved:
  – Precise Orbit Determination (POD) NRT product has been validated by comparison with off-line solutions;
  – POD convergence is monitored;
  – Clock convergence is monitored;
  – Comparison with COSMIC mission data has been achieved;
  – Comparison with NWP analysis fields have been performed.

• Ongoing activities:
  – 1-D Var diagnostic and update of covariance matrix;
  – Comparison with radio-sondes.
GRAS Cal/Val Progress (2)

- Last step for operational service:
  - PPF v2.10 update, 15/04/08
Bending angles from rising and setting occultations have been compared with ECMWF analysis fields. First panel from left: analysis of differences as function of height for all occultations; second panel: rising occultations only; third panel: setting occultations only; fourth panel: percentage of valid measurements as function of height.
ATOVS L2 Validation Progress

• Milestones /Activities Achieved:
  – Tuning of the processor to Metop-A instrument characteristics;
  – Bias correction;
  – Validation of temperature profiles by comparison with NWP fields and radiosonde observations.

• Ongoing activities:
  – Validation of humidity profiles by comparison with NWP forecast and radiosonde data;
  – Validation of cloud and surface parameters.
ATOV S L2 Validation Progress (2)

- Next steps:
  - Start of pre-operational service on 22/04/08;
  - Operational service before 30/4/08;
  - Implementation of NOAA-18 ATOVS L2 service (2Q 2008).
ATOVS L2 Validation Progress (3)

Difference ATOVS Temperature retrieval – ECMWF analysis

Comparison
EUMETSAT- NOAA Temperature retrieval
IASI L2 Validation Progress

- Milestones /Activities Achieved:
  - Bias correction between IASI L1C radiance spectra and ECMWF/RTIASI-4 simulated spectra;
  - Validation of the cloud detection against AVHRR imagery;
  - Validation of cloud fraction against visual inspection of AVHRR imagery;
  - Validation of cloud top pressure and temperature against AVHRR imagery together with ECMWF profiles of temperature,
  - Validation of temperature and humidity profiles against ECMWF forecasts;
  - Validation of cloud phase against visual inspection of AVHRR imagery;
  - Limited case study comparisons of temperature and humidity profiles against campaign data;
  - Validation of surface temperature against ECMWF fields;
  - Validation of cloud parameters, temperature and humidity soundings, with campaign measurements;
  - Validation of surface temperature against the products from the AATSR instrument on Envisat.
IASI L2 Validation Progress

• Ongoing activities:
  – **Operational products**: temperature and humidity profiles and surface skin temperature (twt), cloud parameters (clp) starting 23/04/08 (pending Dissemination Facility upgrade (27/04/08?));
  – Impact studies for IASI L2 to be performed by ECMWF
  – **Trial dissemination** of ozone (ozo) and trace gases (trg) started on 21/2/08.
  – Operational ozo, trg and surface emissivity (ems) products to be part of Day-2 processor deployment.
OUTLOOK

• EPS “Day-2” Products now under way
  - ASCAT Soil moisture index (dissemination start 05/05/08)
  - High-resolution ASCAT
  - AVHRR Polar cap winds (dissemination start October/08)
    • Co-operation with CIMSS/NOAA (Jeff Key)
  - AVHRR Vegetation index
  - IASI compressed radiances, improved retrievals, ASCAT full resolution, GOME improved radiances, GRAS wave optics …
  - Fast track Arctic dumps
  - Antarctic Data Acquisition
  - Two Metops…
Fig. 1. Correlation between scatterometer derived and ERA40 reanalysis soil moisture for absolute values (top) and anomalies (bottom).
Soil moisture increments in mm
OUTLOOK

Reprocessing

- **ASCAT Level 1**
  - Consistent operational calibration

- **GOME-2 Level 1**
  - Already done twice, third round now
  - Detector trending
  - Improved calibration
  - Improved trace gases

- **AVHRR Polar cap winds**
  - To cover IPY (and others) data since beginning of Metop will be re-processed

- **IASI Level 2**
  - Profiles
  - Trace gases
IPY Portfolio

• To be implemented with new EUMETSAT EO Portal
• EUMETSAT contribution to be highlighted
• Archiving of EARS AVHRR data (full resolution started)
• Interface with automatic sub-setting to be considered
IASI CalVal Campaign Summer 2007

- To be added??
  - PTU (RS92-SGP) (360)
  - Ozone sondes (ECC) (40)
  - CFH (7)
  - Brewer
  - microwave
  - etc
Ozone Sonde profiles
Total Ozone