



# Synergetic Earth Observation with EPS/Metop-A



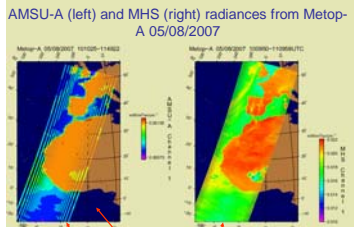
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EUMETSAT

## The Metop-A Satellite



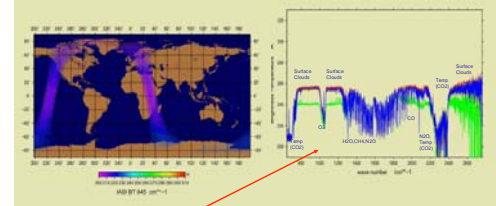
- MetOp-A launched **19th October 2006**
- Sun-synchronous Orbit
- 820 km, **9h30** LST, 102 min
- Only polar data source from mid-morning orbits
- 11 Instruments (8 Meteorological)
- Metop-B and Metop-C recurrent models
- Soyuz launcher service (Baikonour)
- LEOP Service from ESOC (Darmstadt)
- Central and distributed Ground Segment components
- 14 years of operations
- All level-1 products operational
- Level 2 products Pre-operational
- First Day-2 products developed
- Positive Impact on NWP was demonstrated

## Microwave Sounding with ATOVS (Advanced TIROS Operational Vertical Sounder) AMSU-A (Advance Microwave Sounding Unit) and MHS (Microwave Humidity Sounder)

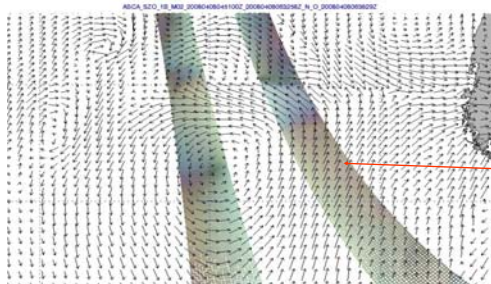


## Hyper-Spectral Infrared Sounding with IASI (Infrared Atmospheric Sounding Interferometer)

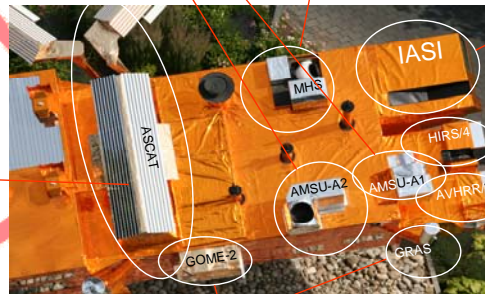
IASI Metop-A 15 January 2007 1808-1952UTC



## Active Microwave Retrieval with ASCAT (Advanced Scatterometer)

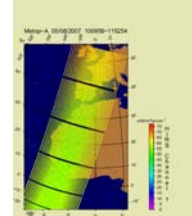


ASCAT Level 1b product from Metop-A (08/04/2008) with overlaid derived ocean surface wind vectors

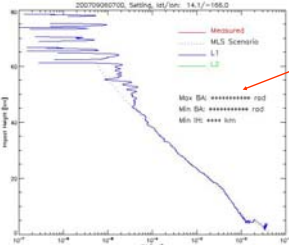


## Infrared Sounding with ATOVS (Advanced TIROS Operational Vertical Sounder) HIRS/4 (High Resolution Infrared Radiation Sounder)

HIRS/4 Channel 1 radiances from Metop-A 05/08/2007

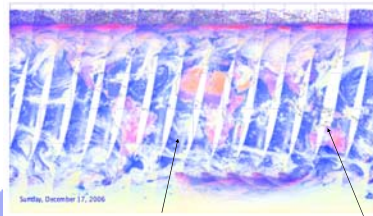


## Passive Microwave Retrieval with GRAS (GNSS Radio-Occultation Atmospheric Sounder)



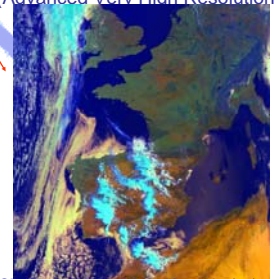
GRAS Level 1b product: Bending angle from a setting occultation 06/09/2007 (EUMETSAT GRAS team, 2008)

## UV/VIS/NIR Sounding with GOME-2 (Global Ozone Monitoring Experiment)



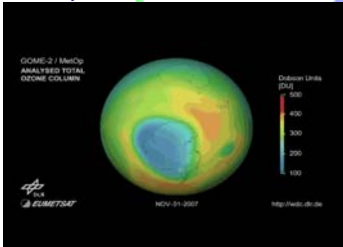
GOME False Colour Image from the PMD for the 17 December 2006, demonstrating the different measurement modes. (R. Munro, 2007)

## Visible, Near Infrared and Infrared Imaging Support AVHRR/3 (Advanced Very High Resolution Radiometer)



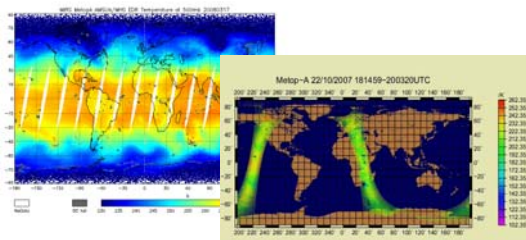
AVHRR RGB (Channels 3, 2, 4) from Metop-A 5/08/2007 1010 UTC.

## Chemistry Products from GOME and IASI



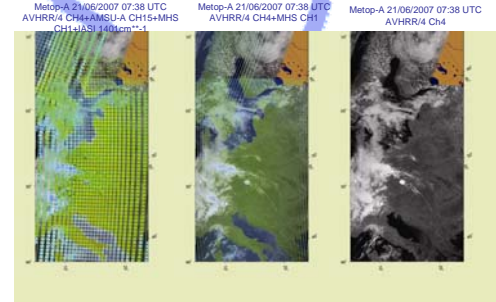
Global Total Ozone derived from Metop-A GOME-2 data, 1 November 2007. (DLR, 2007)

## Atmospheric Parameters from IASI and ATOVS



ATOVS (left, from NOAA/NESDIS, 2008) and IASI (right, Schlüssel et al., 2007) from Metop-A derived atmospheric temperatures at 500 hPa (left) and 0.05 hPa (right).

## AVHRR, MHS and AMSU and IASI

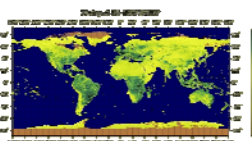


## Summary and Conclusion

- ✓ Metop-A provides continuity of services
- ✓ Metop-A provides innovative observations and advances operational meteorological satellite observations (notably IASI)
- ✓ Reduced data latency soon (in 2010), Council did approve in 12/08 => thanks to cooperation and offer from NOAA
- ✓ All instruments work well and all products are operational
- ✓ Proven impact on Numerical Weather Prediction (NWP) of Metop data (e.g. at ECMWF and UK Met Office)
- ✓ With Metop-B and Metop-C we provide at least 14 years of operations
- ✓ The era beyond Metop has started - jointly with NOAA towards a Joint Polar System (JPS)
- ✓ The JPS should be the first part of the GEOSS that will be coordinated already during the planning stage

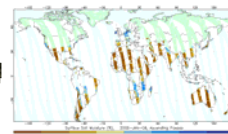
## Day-2 Products already delivered

### NDVI from AVHRR



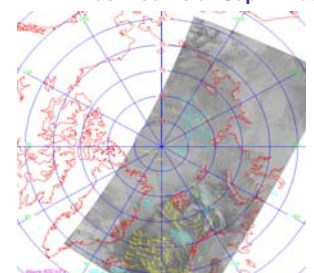
AVHRR/3 full resolution derived Day-2 Product from Metop-A: Normalised Differential Vegetation Index (NDVI) for a ten day period (1-10/04/2007)

### Soil Moisture from ASCAT



ASCAT derived Day-2 Product: Surface Soil Moisture in % for 9/01/2008, derived from Metop-A ascending passes. (Z. Bartalis, 2008)

## Day-2 Product under development: AVHRR derived Polar Cap Winds



AVHRR/4 on Metop-A derived Polar Cap Winds (CIMSS, 2007)