



EUMETSAT NEWS

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www.eumetsat.int



26 Member States & 5 Cooperating States *

Member States

- | | | | |
|---|---|--|--|
| 
AUSTRIA | 
BELGIUM | 
CROATIA | 
CZECH REPUBLIC |
| 
DENMARK | 
FINLAND | 
FRANCE | 
GERMANY |
| 
GREECE | 
HUNGARY | 
IRELAND | 
ITALY |
| 
LATVIA | 
LUXEMBOURG | 
NETHERLANDS | 
NORWAY |
| 
POLAND | 
PORTUGAL | 
ROMANIA* | 
SLOVAK REPUBLIC |
| 
SLOVENIA | 
SPAIN | 
SWEDEN | 
SWITZERLAND |
| 
TURKEY | 
UNITED KINGDOM | | |

* Pending full ratification

Cooperating States

- | | | |
|--|--|--|
| 
BULGARIA | 
ESTONIA | 
ICELAND |
| 
LITHUANIA | 
SERBIA | |



EUMETSAT Space Segment



30

... 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

METEOSAT FIRST GENERATION

- METEOSAT-6
- METEOSAT-7

METEOSAT SECOND GENERATION

- METEOSAT-8
- METEOSAT-9
- METEOSAT-10
- METEOSAT-11

METEOSAT THIRD GENERATION

EUMETSAT POLAR SYSTEM

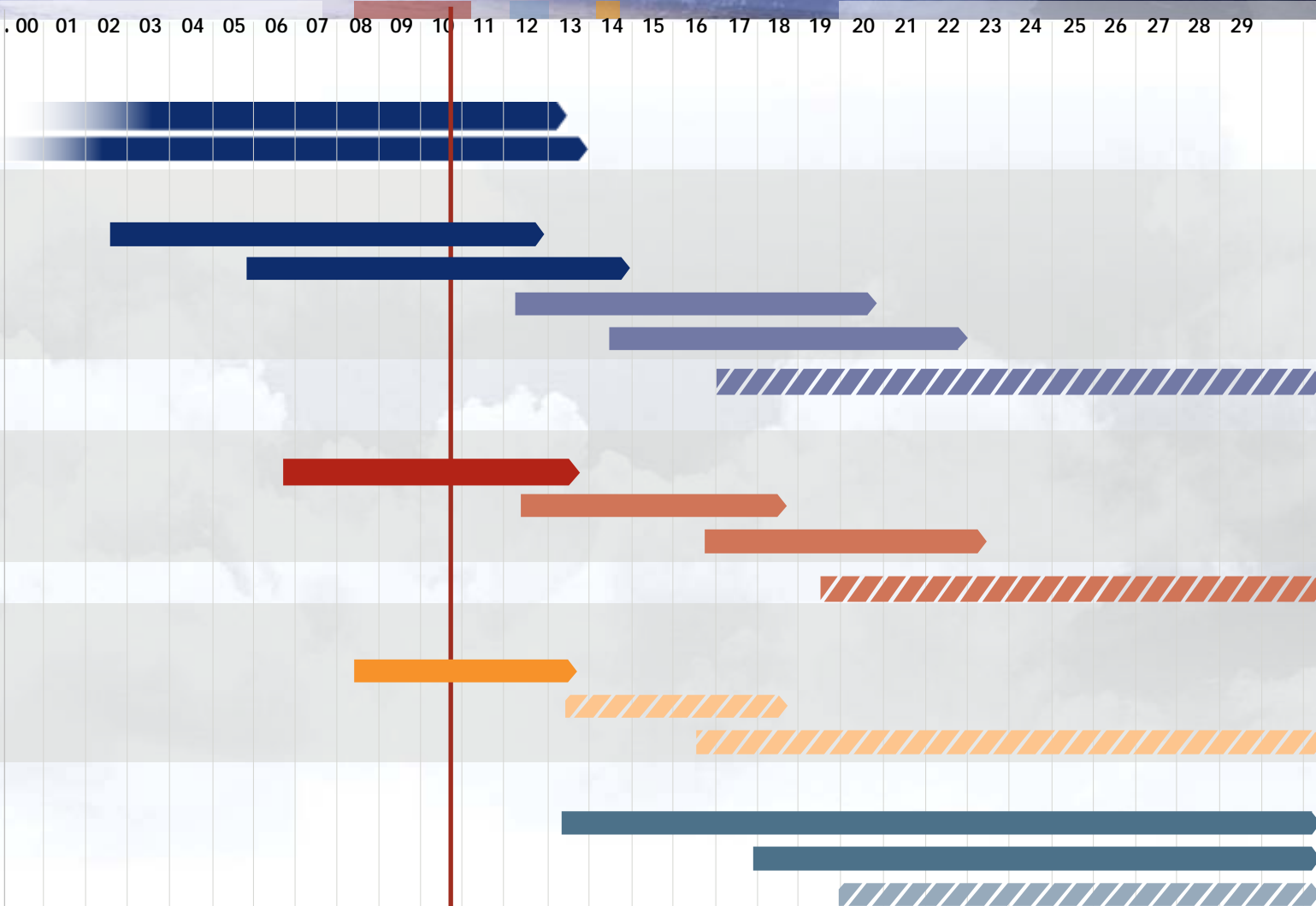
- METOP-A
- METOP-B
- METOP-C
- POST-EPS

OCEAN SURFACE TOPOGRAPHY MISSION

- JASON-2
- JASON-3
- JASON FOLLOW-ON

THIRD PARTY PROGRAMMES

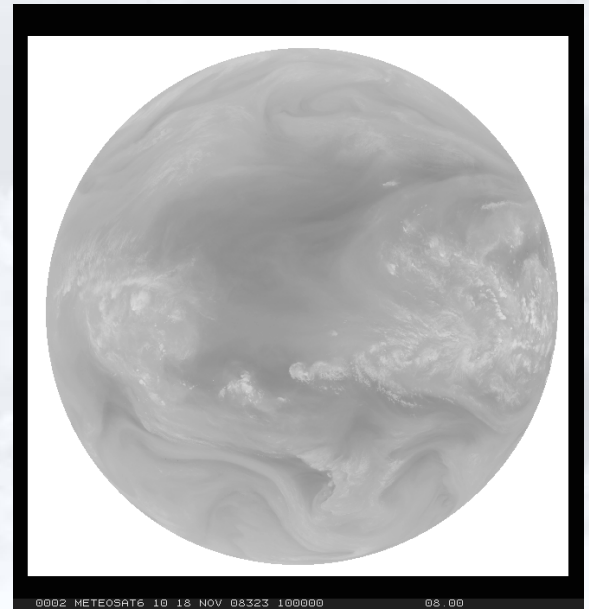
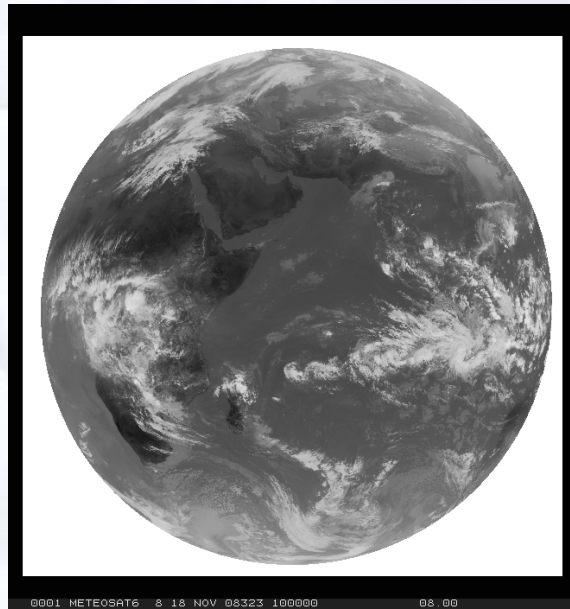
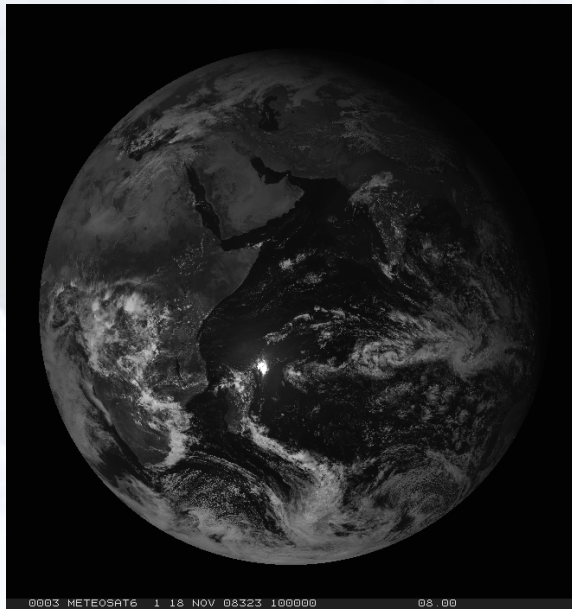
- GMES SENTINEL-3A/B
- GMES SENTINEL-4
- GMES SENTINEL-5





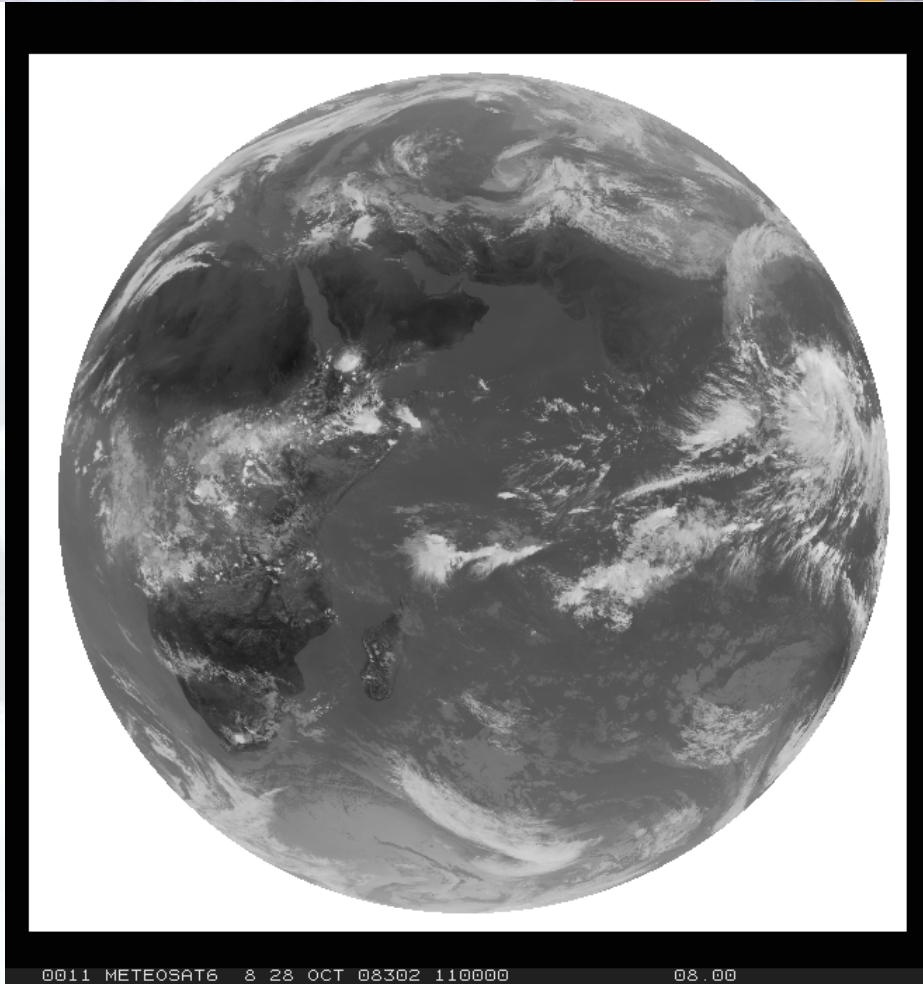
Meteosat First Generation

Operational imager mission over the Indian Ocean since 1998
3-channel radiometer (VIS, IR, WV), image repeat cycle 30 minutes





Meteosat-6: An Interesting Case



Radiometric Anomaly
needs correction through
cross-calibration with
e.g. MSG



MSG – Operational Service since 2004

Meteosat-8: stand-by satellite, over 10 E, currently in "rapid scan" mode

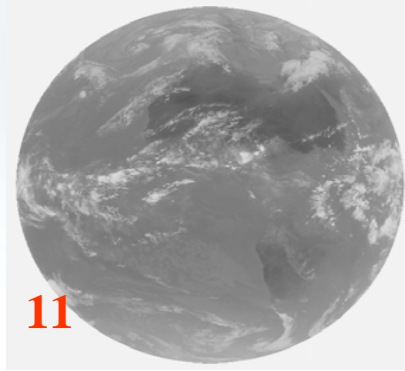
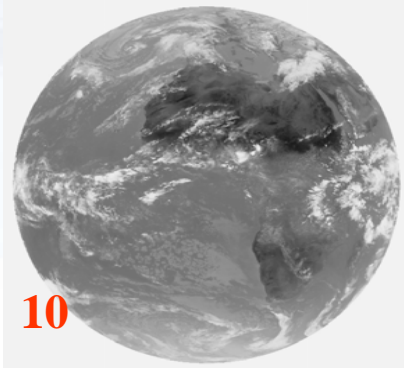
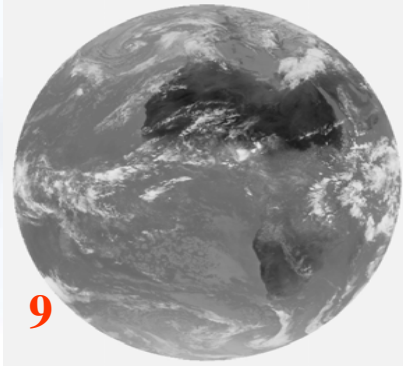
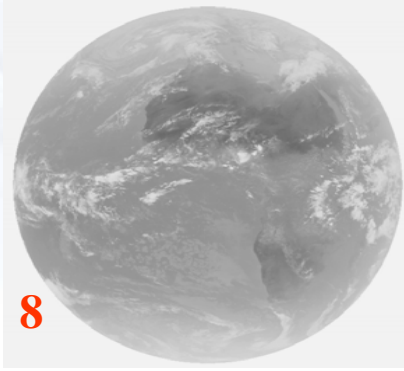
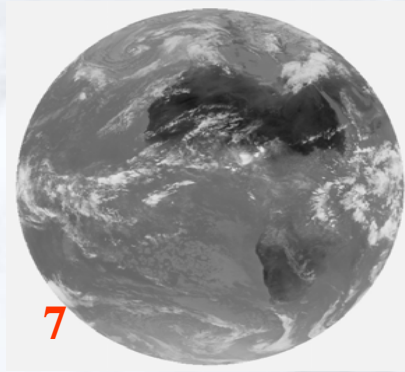
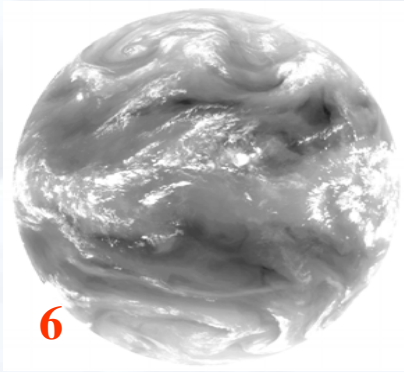
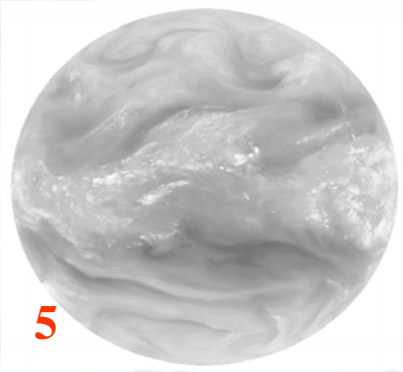
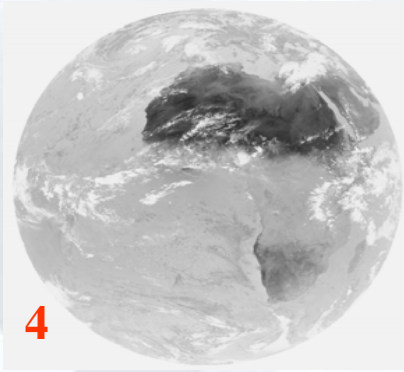
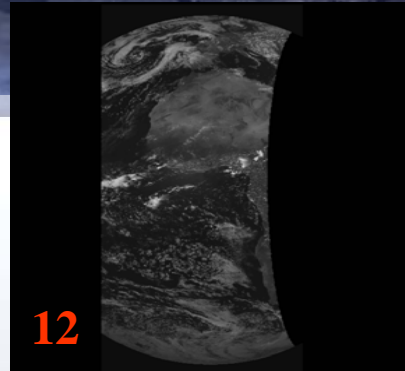
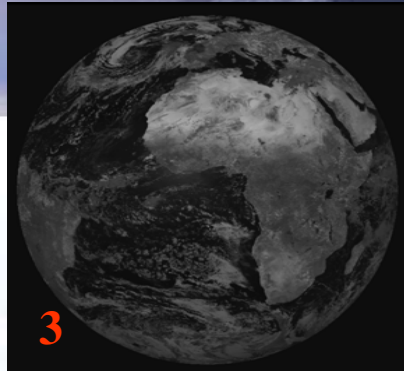
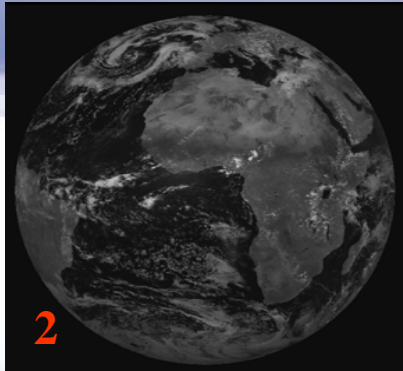
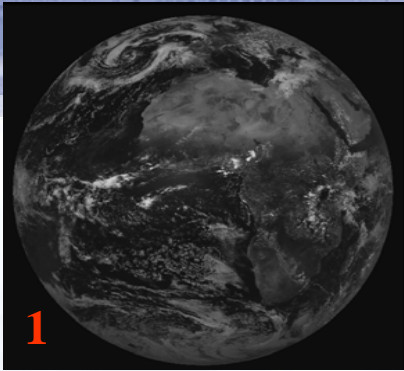
Meteosat-9: operational satellite, over 0 deg

Some MSG facts:

- 12-channel radiometer ("SEVIRI")
- 15 minute repeat cycle for full disk scans
- 3 km pixel sampling distance, 1 km for HRV
- Main instrument is SEVIRI (spinning enhanced visible and infrared imager)
- Series of 4 MSG satellites – MSG-3 launch in 2012, MSG-4 in 2014



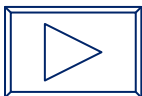
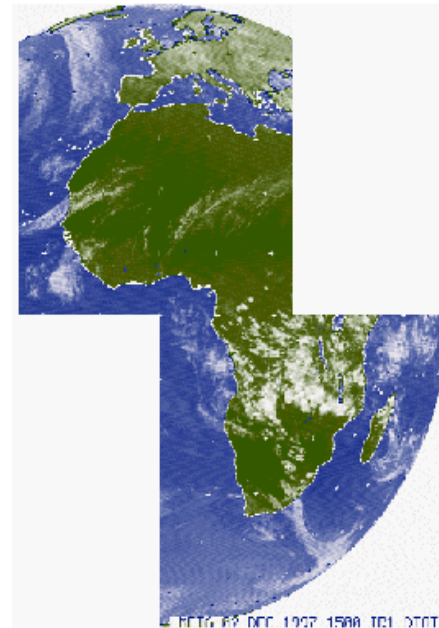
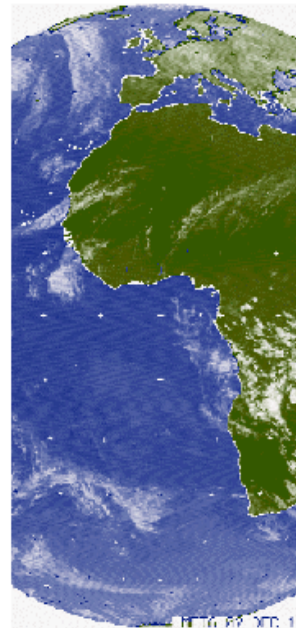
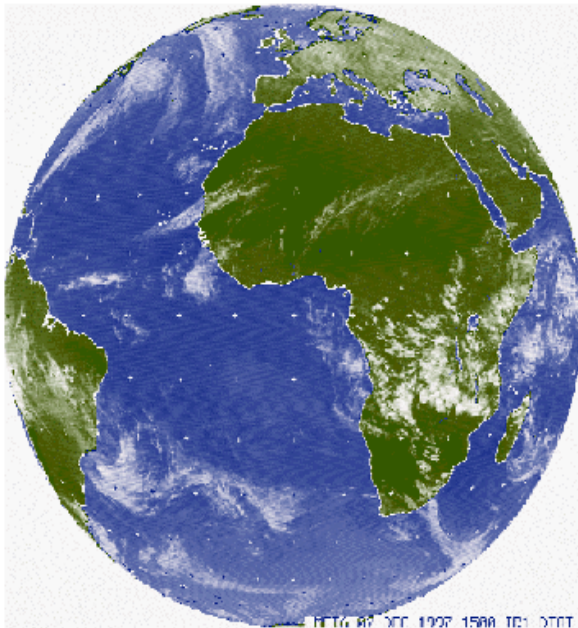
SEVIRI Overview





HRV: A Special Case

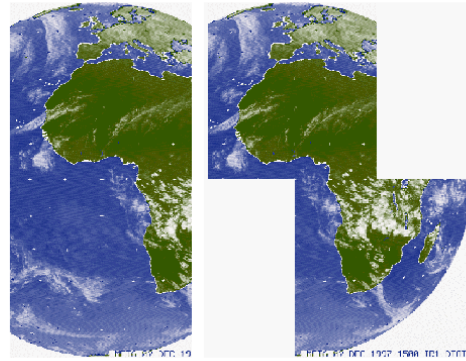
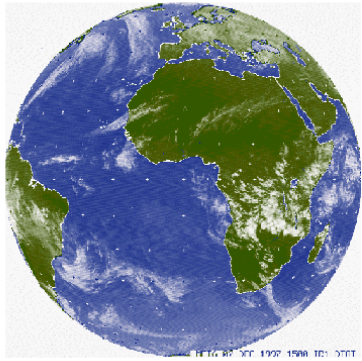
High data rate allows only transmission of half a scan line.
Two blocks of "half lines" can be selected.



(current setup)



HRV Coregistration with other Channels

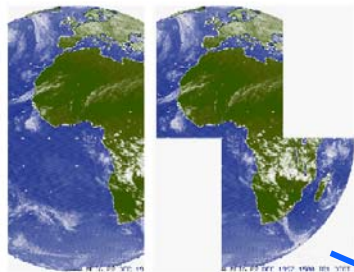
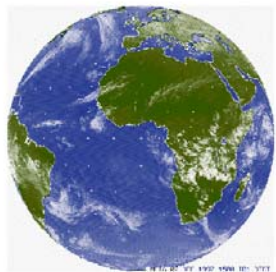


Full disk:
3712 Lines
3712 Elements per line

HRV:
 $3712 * 3 = 11136$ Lines
 $(3712 * 3) / 2 = 5568$ Elements



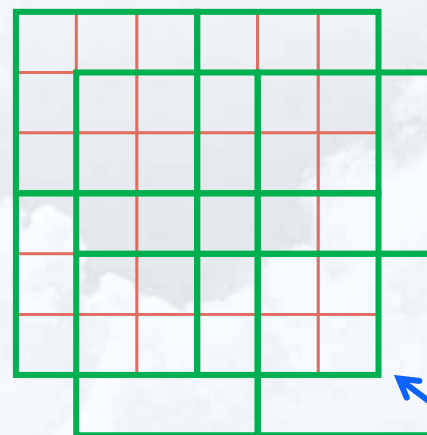
HRV Coregistration with other Channels



Full disk:
3712 Lines
3712 Elements per line

HRV:
 $3712 * 3 = 11136$ Lines
 $(3712 * 3) / 2 = 5568$ Elements

But:
Alignment of the two grids:



HRV 1 km

Other 3km channels,
"intuitive"

Other 3km channels,
"true"

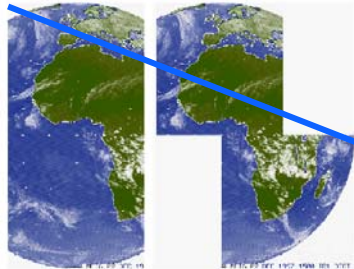
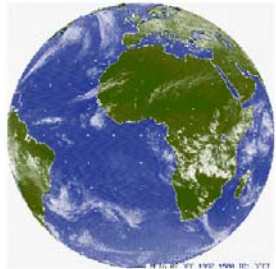
SE Image Corner

First pixel in first row in SE corner:

Center of HRV Pixel (1,1) coincides with **center** of 3km-Pixel (1,1)



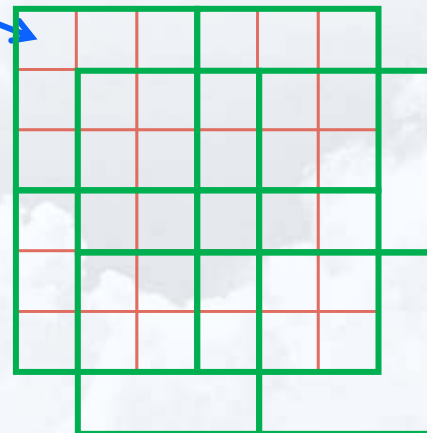
HRV Coregistration with other Channels



Full disk:
3712 Lines
3712 Elements per line

HRV:
 $3712 * 3 = 11136$ Lines
 $(3712 * 3) / 2 = 5568$ Elements

NW Corner – McIDAS (1,1):



HRV 1 km

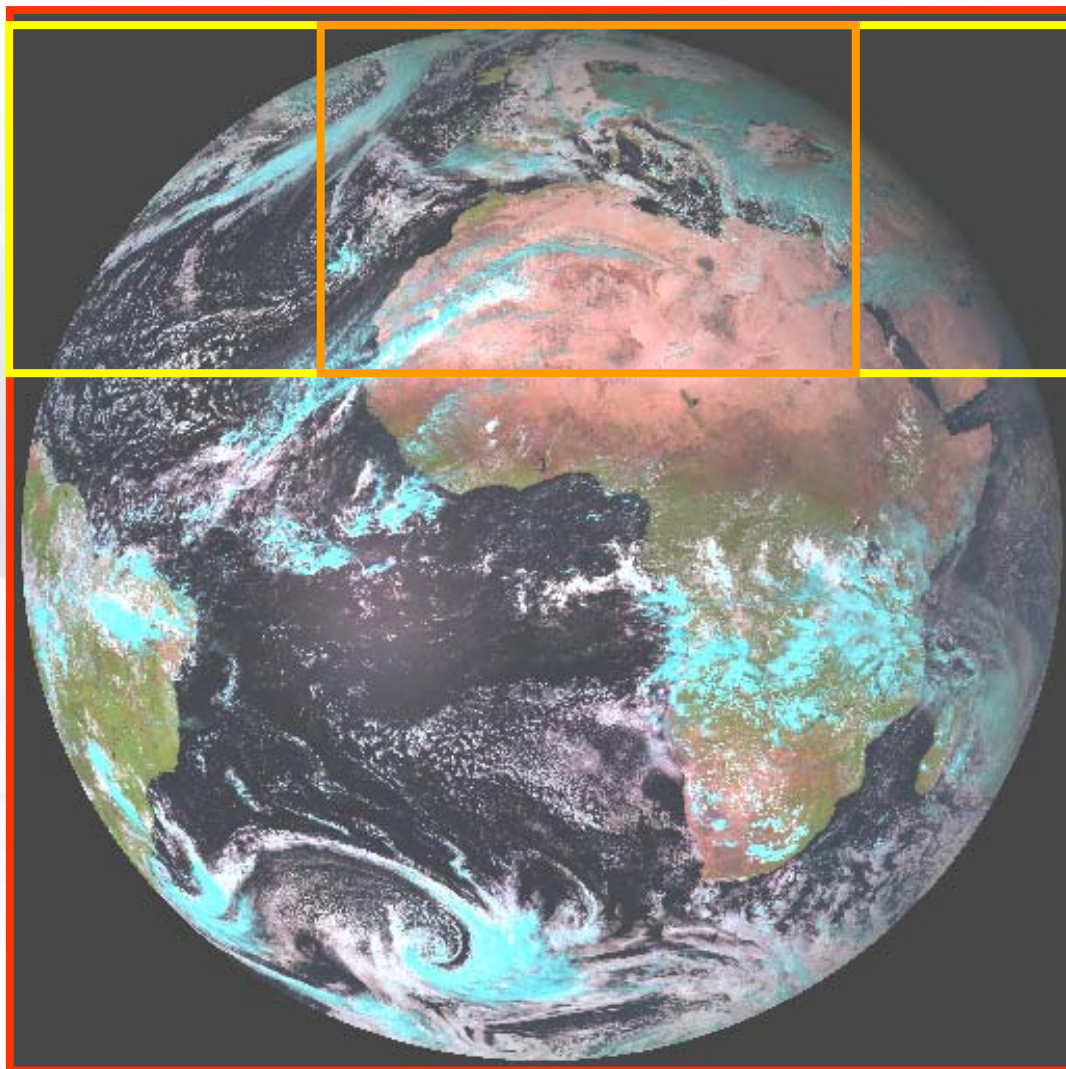
Other 3km channels,
"intuitive"

Other 3km channels,
"true"

For the NW corner (mcidas (1,1)):
First 3km-Pixel coincides with HRV Pixel (3,3)



Meteosat-8: Rapid Scanning Service



Repeat Cycle 5 min
Position 9.5 E

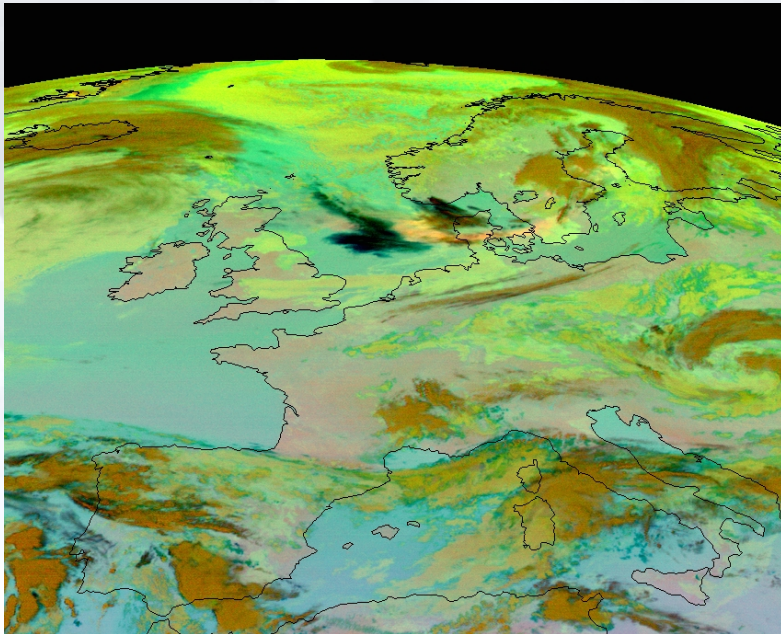
HRV window in orange



MSG Benefits

Long list of NWP and Nowcasting applications

Hot topic in 2010: Volcanic Ash from Eyjafjalla eruption





MSG Calibration: GSICS

One GSICS Product: Daily cross-calibration to IASI

EUMETSAT Monitoring weather and climate from space

Home > Access to Data > Inter-calibration Services > GSICS Meteosat IR Inter-calibration

ACCESS TO DATA

- Product Navigator
- Delivery Mechanisms
- Meteosat Image Services
- Meteosat Meteorological Products
- Data Collection and Retransmission
- Environmental Data Services
- Other Geostationary Services
- Metop & NOAA Services
- Inter-calibration Services**
 - Meteosat - NOAA HIRS
 - GSICS Meteosat IR Inter-calibration**
 - EUMETSAT Data Centre
 - User Support

GSICS Meteosat IR Inter-calibration

This page demonstrates prototype results of the inter-comparison of equivalent infrared channels of geostationary **Meteosat imagers** and the polar-orbiting **IASI** sounder from collocated observations. The data will be updated twice every 5 days, around 0700UTC. The activity is an important milestone toward an operational GSICS. Similar activities are currently pursued by other GSICS participants. The results, using the **inter-calibration algorithm**, can also be downloaded as **Statistical Data**, in **NETCDF Format**, from **EUMETSAT's GSICS Data and Product Server**. The results for 2007 were analysed by Hewison and König, 2008 (See **Inter-Calibration of Meteosat Imagers and IASI** from the Proceedings of the EUMETSAT Satellite Conference, Darmstadt, Germany, September 2008).

Satellite:

Channel:

Date: Year: Month: Day:

Time:

Display:

Download:

Legend

- * Bias fitted at T_{low} from 1 night-time overpass
- * Bias fitted at T_{low} from 1 day-time overpass
- ♦ Monthly mean Bias from all night-time data
- Trend in night-time data

Error bars: 1- σ uncertainty

MSG2 IR13.4

MSG2-IASI Tb [K]

06 07 08 09 10 11 12 01 02 03 04 05
2008

http://www.eumetsat.int/Home/Main/AboutEUMETSAT/InternationalRelations/CGMS/SP_1226312587804



European Polar System EPS



Metop-A is Europe's first operational polar orbiting weather satellite, in orbit since 2006. Metop-B will be launched on 02 April 2012.

09:30 ECT descending node

Suite of instruments for imaging and sounding capabilities, active radar: AVHRR, AMSU, MHS, IASI, GOME, GRAS, ASCAT

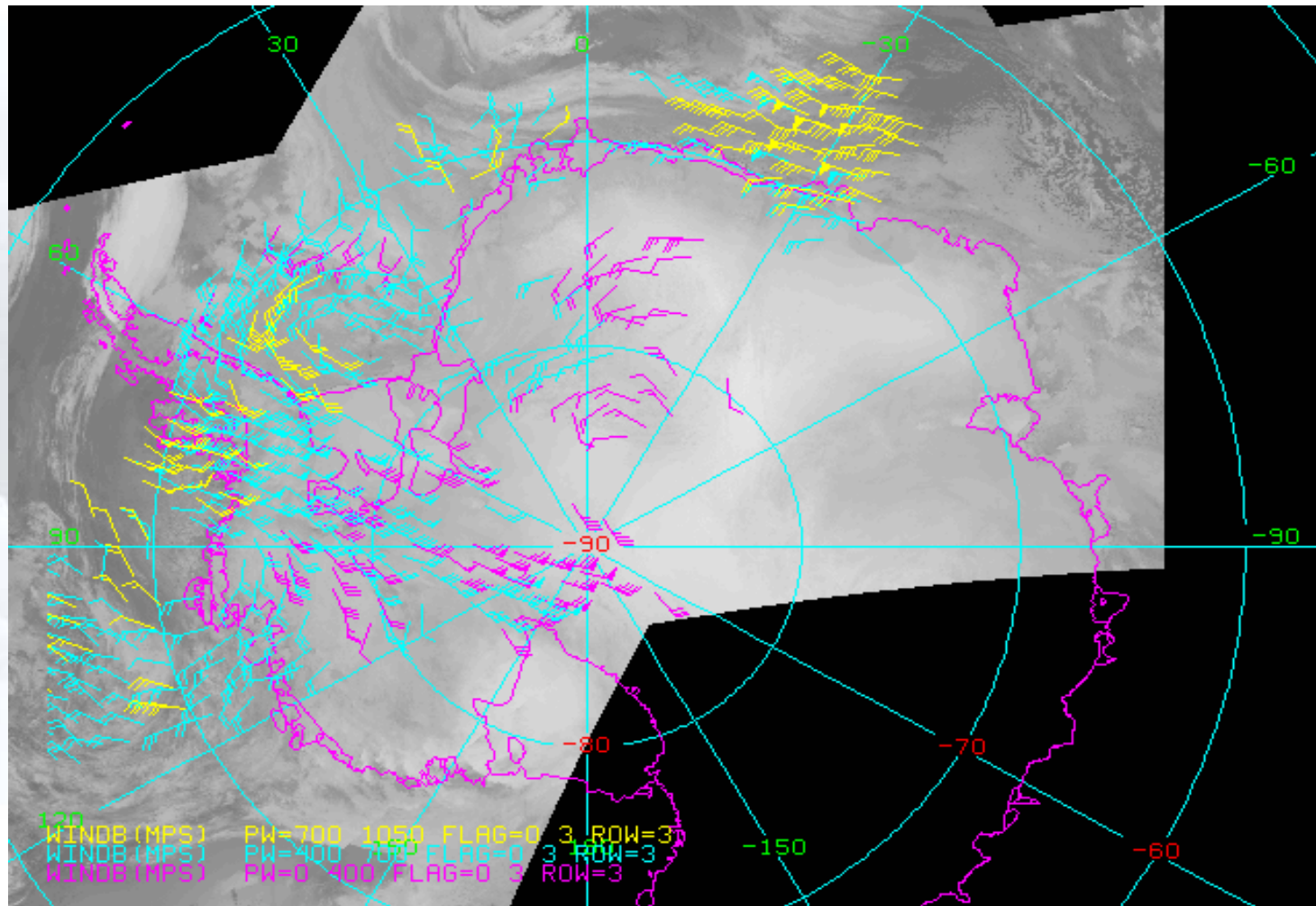


AVHRR on Metop: Global 1km Resolution





Polar Winds from AVHRR

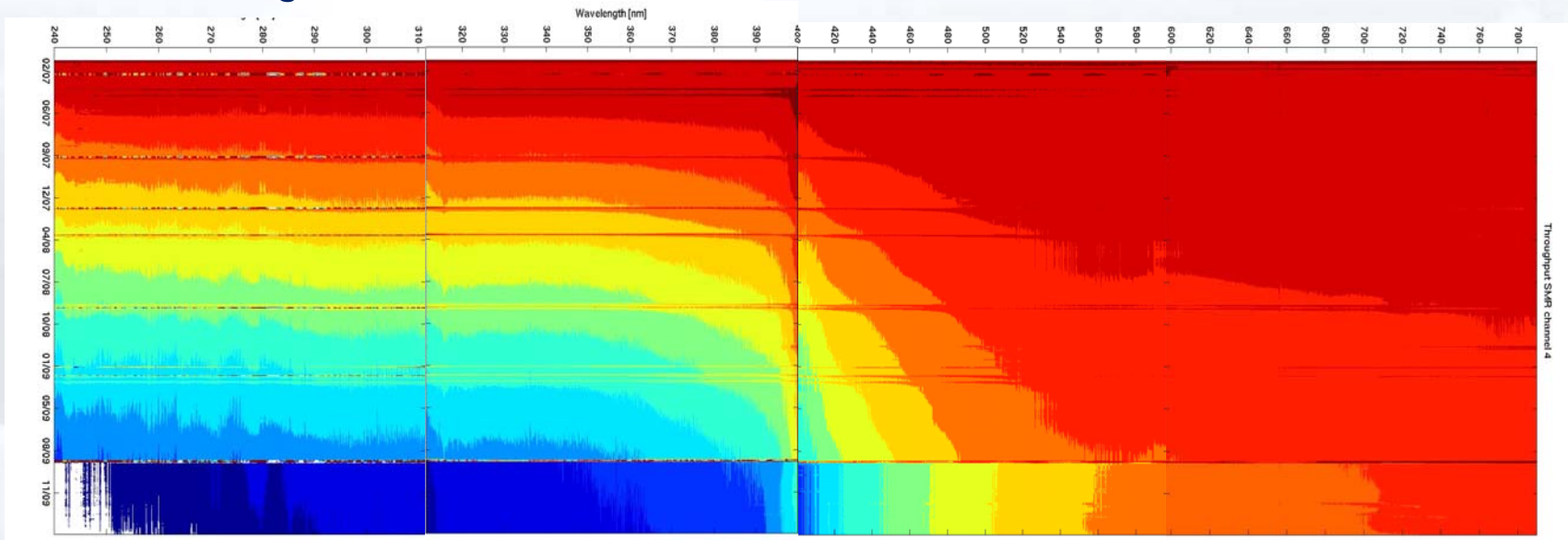




GOME: Sensitivity Loss since Launch

Time since Launch

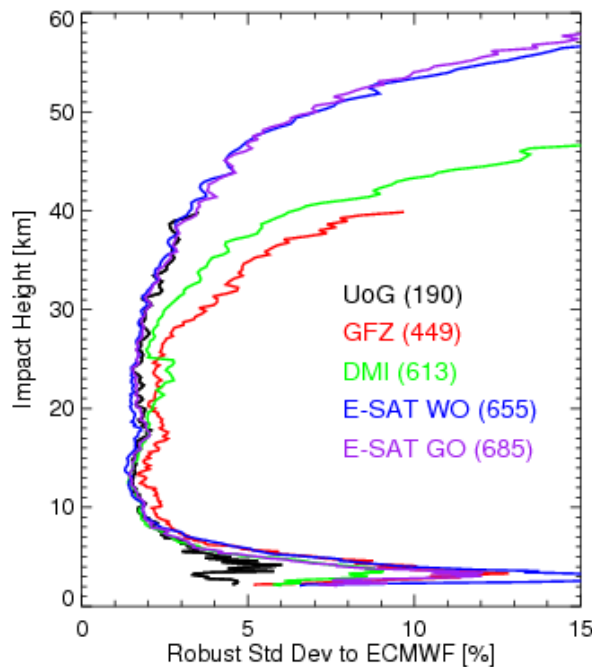
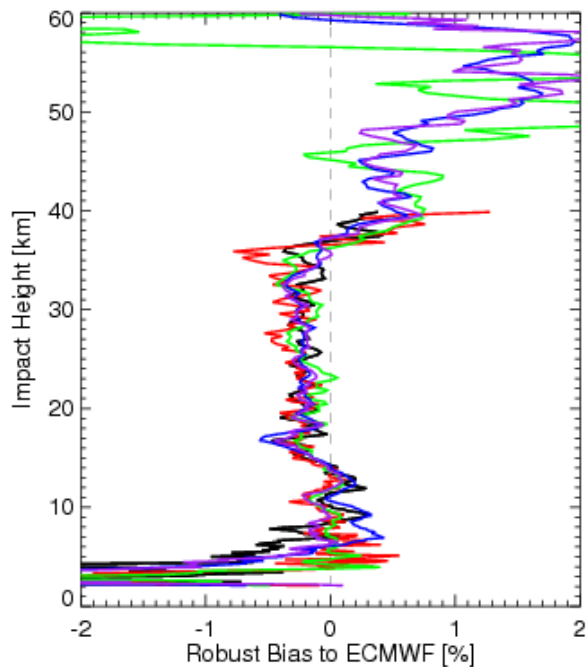
Wavelength: 240 – 780 nm in ~4000 channels



40 – 100% Throughput



GRAS – Radiooccultation Instrument

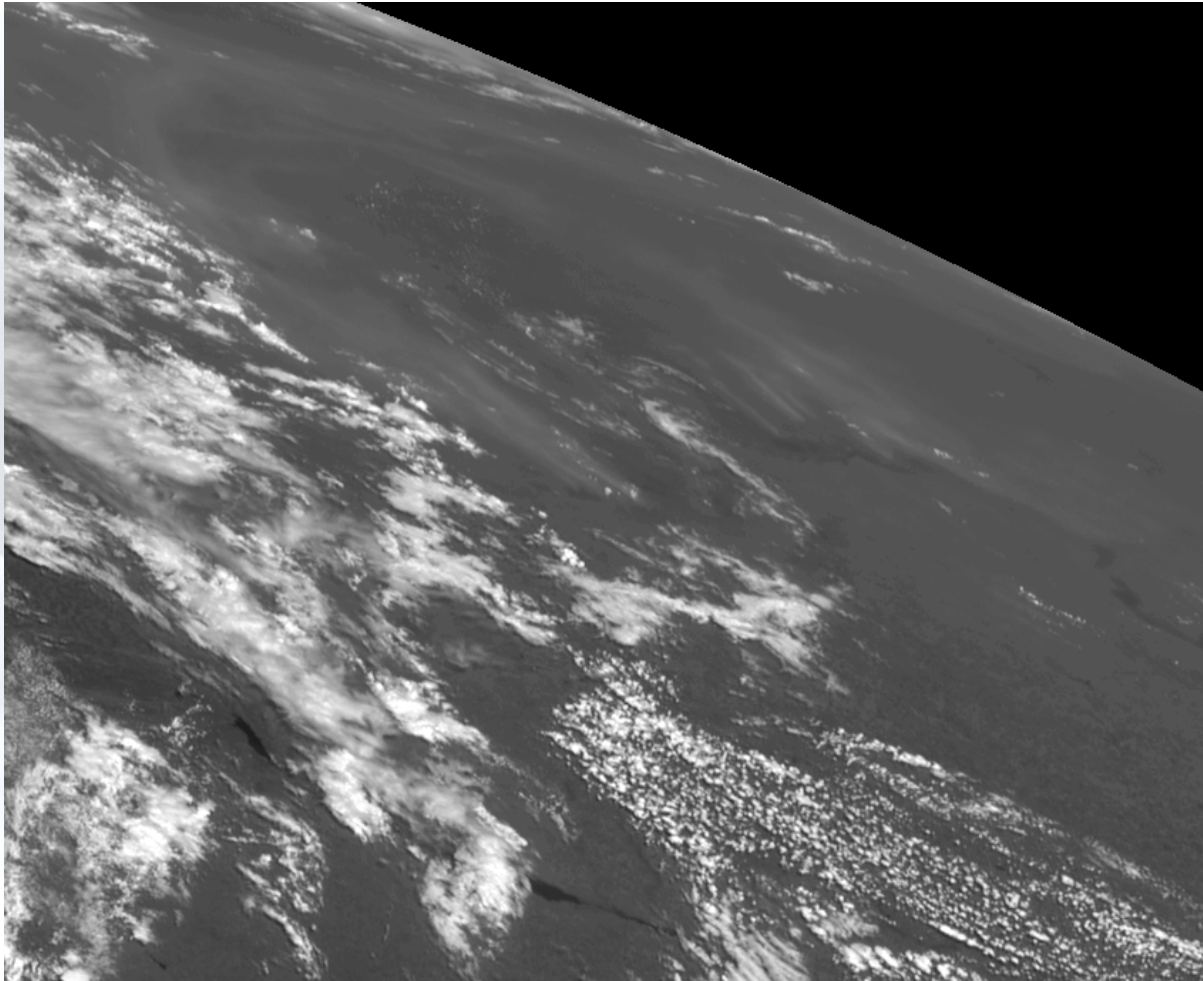


Ongoing:
Update of processing
software to wave
optics:

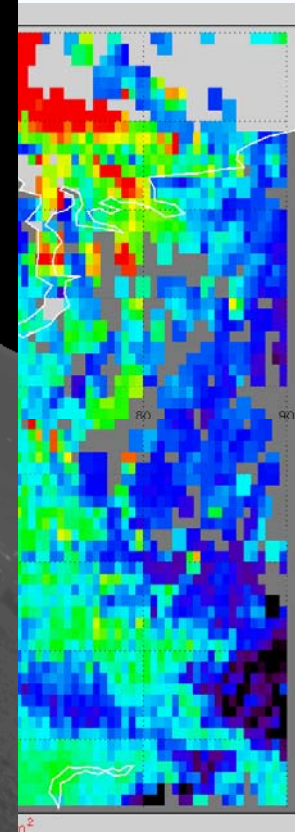
Wave Optics open
possibility to retrieve
profiles down to ~2 km
height



IASI: CO Retrievals – Russian Fires in 2010

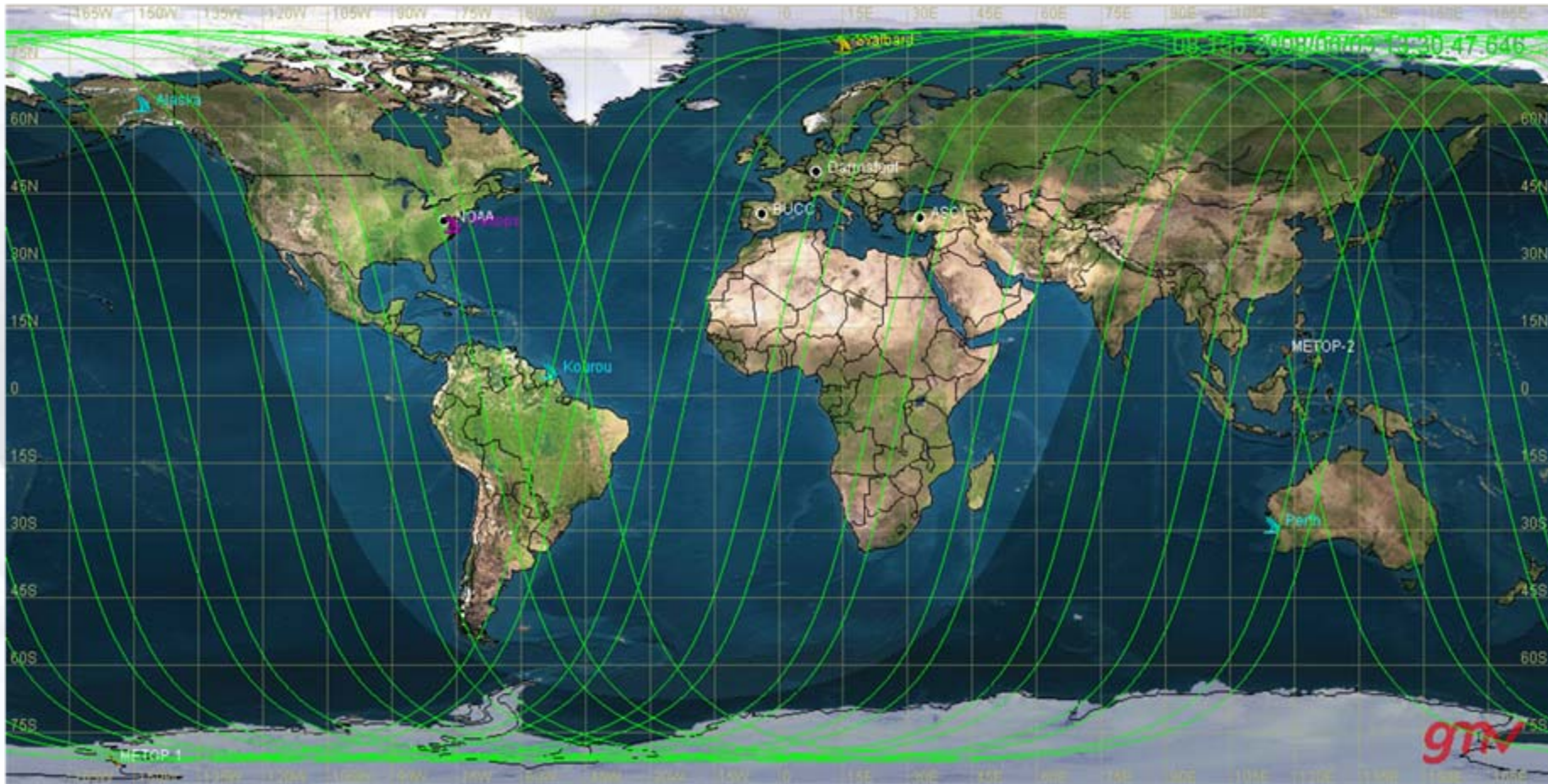


10 AUGUST 2010 10:45 UTC





Metop-B: 48 min Separation to Metop-A





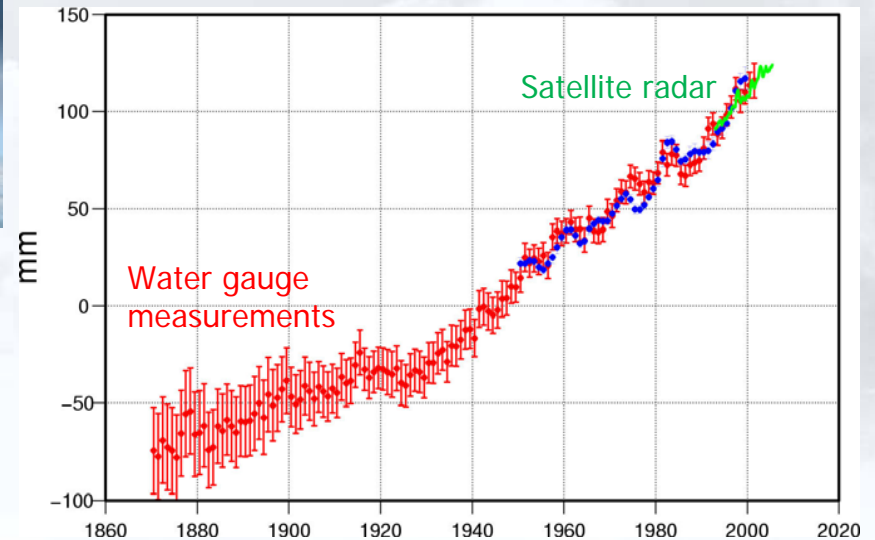
JASON-2: EUMETSAT – NASA – NOAA – CNES



Launched in 2008

Main payload: ocean surface altimeter

To be continued through JASON-3 (2011-2013) and Sentinel-3 beyond 2013





Future: Meteosat Third Generation

Twin Satellite Configuration, 3-axis stabilised platforms:

MTG-I: Imager Satellite carrying the FCI instrument (Flexible Combined Imager), the Lightning Imager (LI) and the Data Collection and SAR packages

MTG-S: Sounder Satellite carrying the hyper-spectral infrared sounder IRS and a UVN instrument for GMES (Sentinel-4)

Final operational configuration:

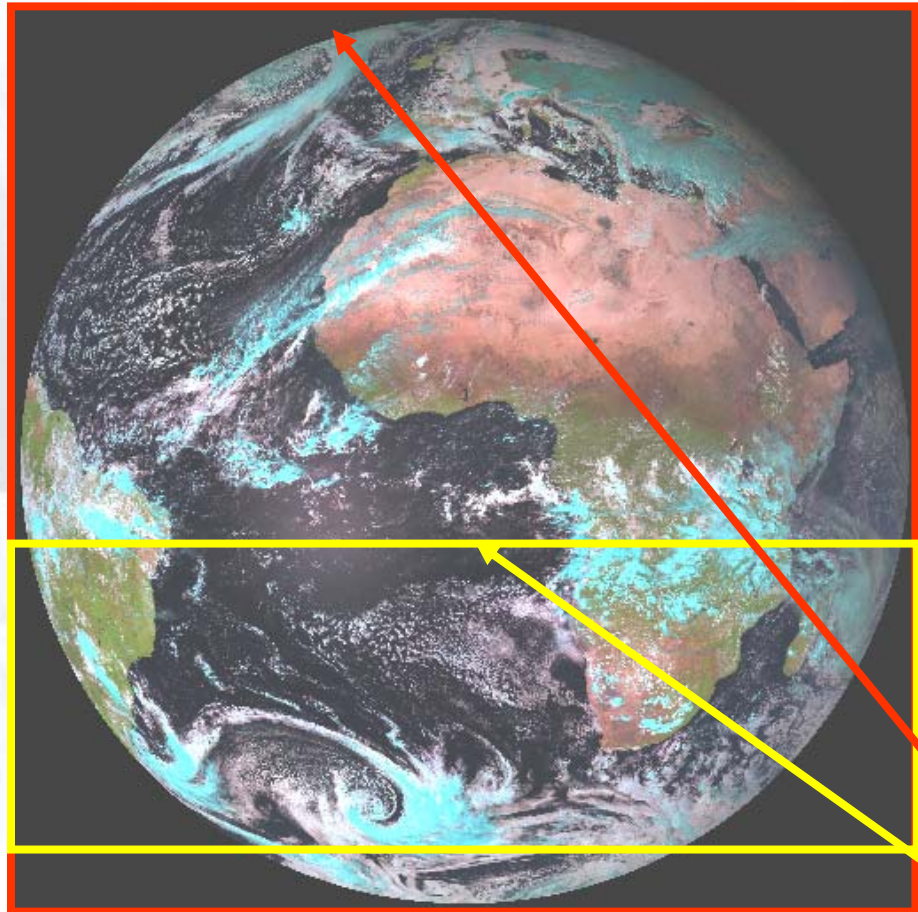
2 imaging satellites for full disk and regional scans

1 sounder satellite

Full programme: 4 MTG-I and 2 MTG-S satellites



MTG-I: Imager



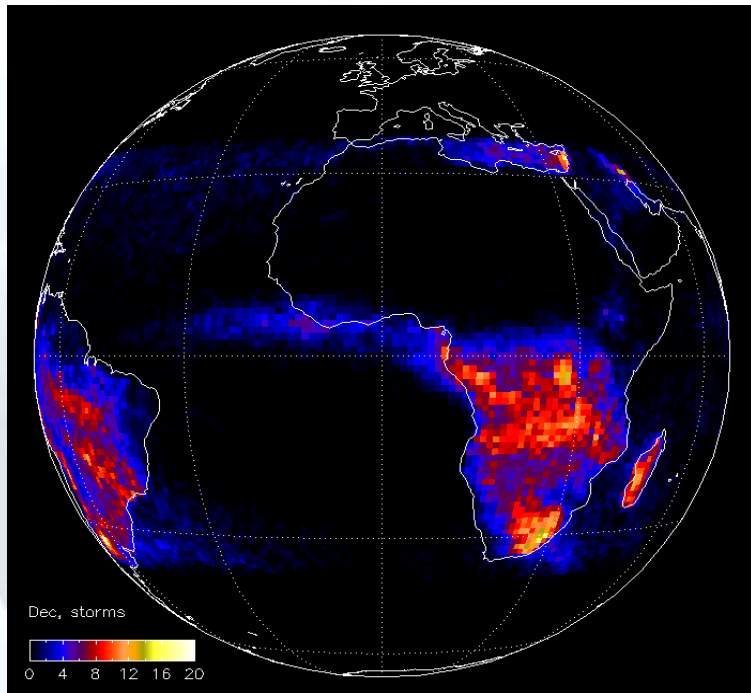
Launch of first MTG-I anticipated for 2016,
second MTG-I in ~2022
(I3 in 2025, I4 in 2029)

16 channels, spatial resolution between 0.5 and 2 km

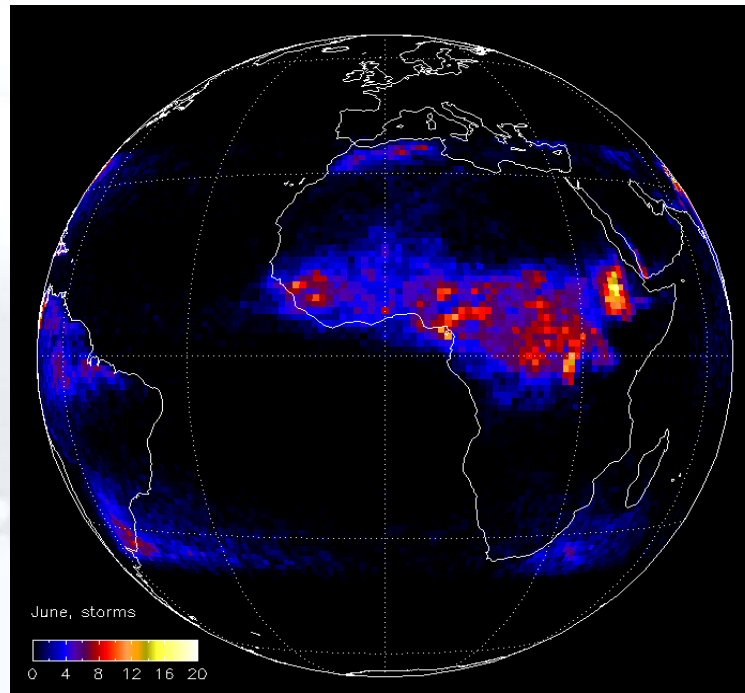
	Coverage	Repeat cycle
Full Disk Coverage	18°x18°	10 min
Local Area Cov.	1/4 FD	10/4 min



MTG-I Lightning Instrument



LIS - December

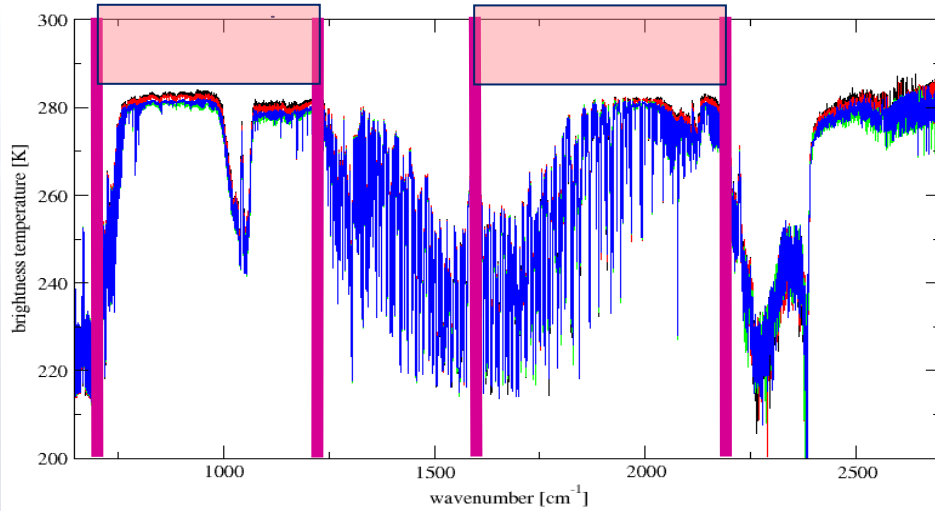


LIS - June

Provision of continuous lightning information (IC + GC) from the 0deg position

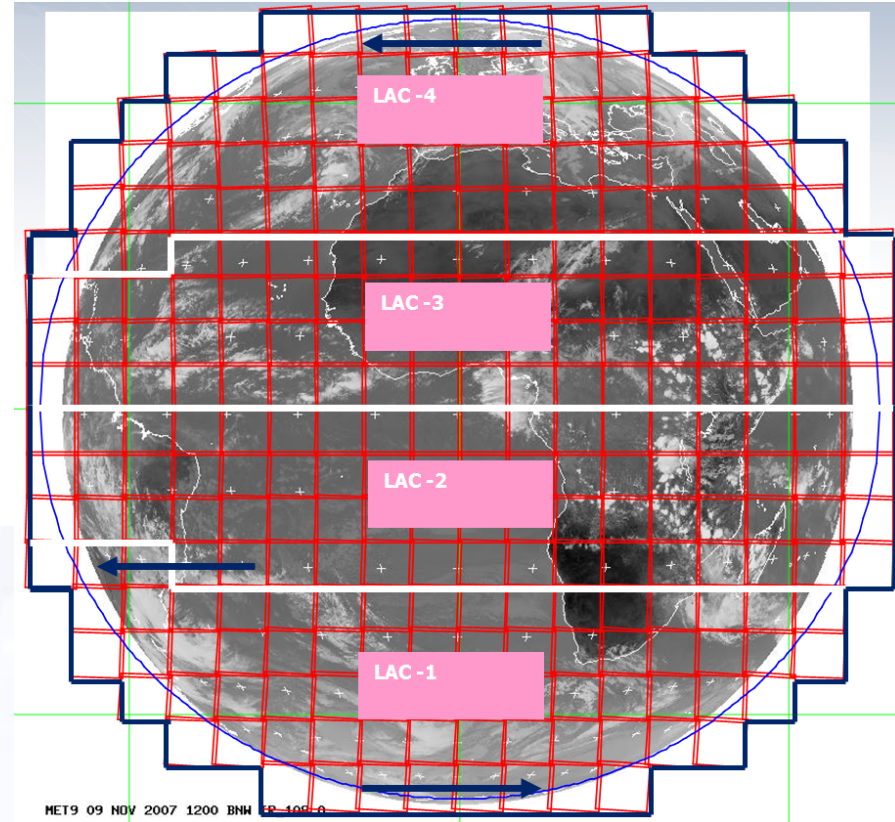


MTG-S



IRS: 700-1210 cm^{-1} ,
and 1600-2175 cm^{-1} @0.625 cm^{-1} resolution

Spatial resolution at nadir: 4km





MTG-S UVN Sounder



The GMES Sentinel-4 (S4) sounding mission is achieved through the Ultraviolet, Visible & Near-infrared (UVN) Instrument accommodated on the MTG-S satellites

- covering Europe every hour
- taking measurements in three spectral bands (UV: 305 - 400 nm; VIS: 400 - 500 nm, NIR: 750 - 775 nm)
- with a resolution around 8km.

The primary data products are O₃, NO₂, SO₂, HCHO and aerosol optical depth.



Very much Future: Post-EPS or EPS-SG

EPS-SG is part of Joint Polar System with US

Phase-A studies will start in 2010/2011

Concept studies for METImage and IASI-NG in progress

Launch need >2020, possibly multi-satellite constellation

JPS Notional Assignments

Orbit, Operator, Satellites, Instruments

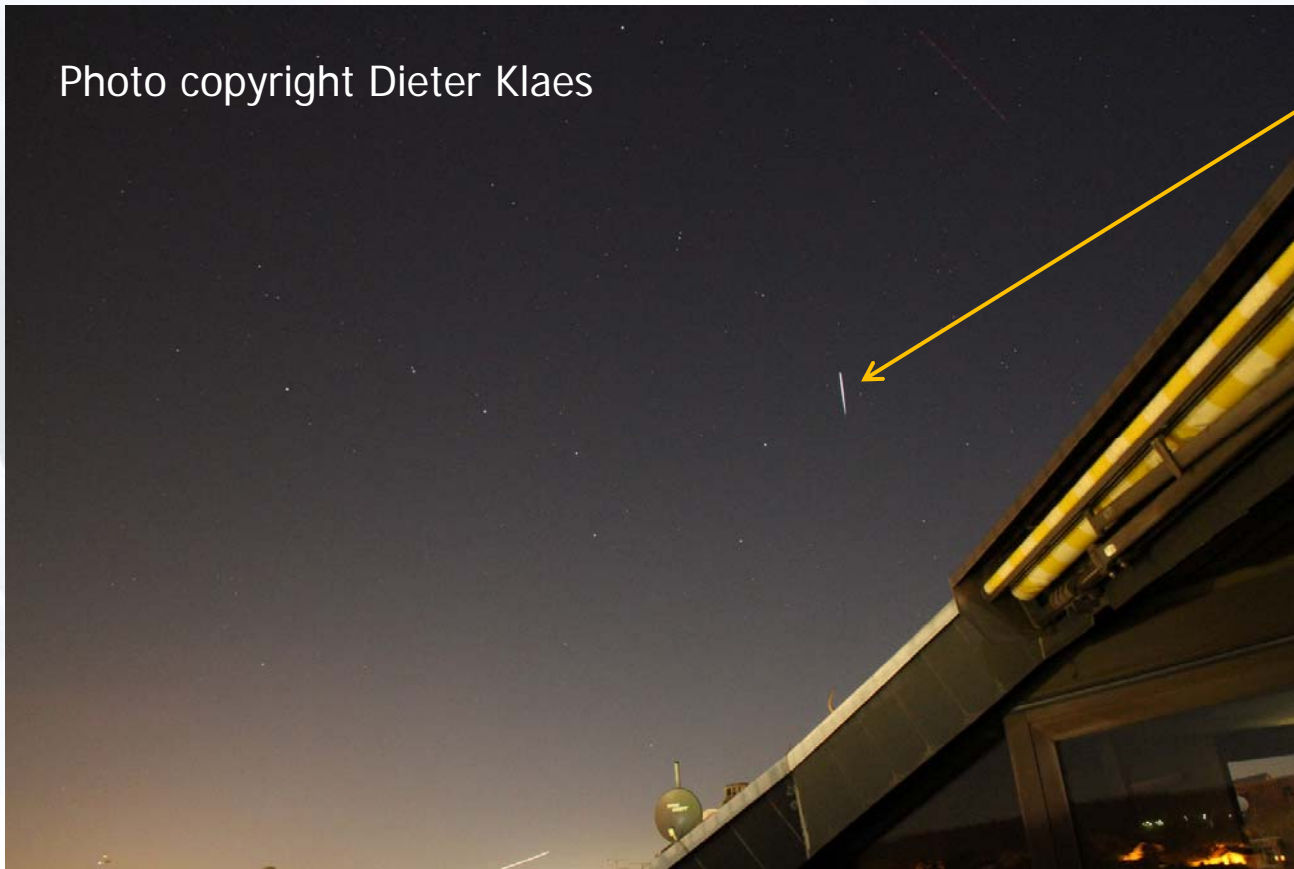
Instrument Type	Provider	05:30 (LTDN) DoD DWSS	09:30 (LTDN) EUMETSAT EPS-SG Satellites	13:30 (LTAN) NOAA JPSS-1/2/3+
		Visible/Infrared Imager	NOAA	VIIRS(TBC)
	EUMETSAT		METImage	
Low Light Imager	NOAA		LLI	
Infrared Sounder	NOAA			JPSS-1/2: CrIS
	EUMETSAT		IASI-NG	JPSS-3+: IASI-NG
Microwave Sounder	NOAA	MW Sensor	ATMS	ATMS
	EUMETSAT		MWS (option)	
Microwave Imager	NOAA	MW Sensor		GCOM AMSR-2 Data
	EUMETSAT		MWI (Cloud/Precipitation)	
Scatterometer	NOAA	Possibly in dedicated constellation		
	EUMETSAT		SCA	
Atmospheric Chemistry	EUMETSAT		GMES Sentinel-5	
	NOAA			OMPS N&L
Aerosol	EUMETSAT		3MI	
	NOAA			
Radio Occultation	NOAA	Pursuing dedicated constellation (COSMIC f/o)		
	EUMETSAT		RO	
Space Environment	NOAA	SEM-N(TBC)	SEM-N(TBC)	SEM-N(TBC)
Earth Radiation	NOAA		CERES f/o	CERES f/o
Solar Irradiance	NOAA			TSIS (may be on a small sat)
Data Collection	NOAA			ARGOS-4 (may be on a small sat)
	EUMETSAT		ARGOS-4	
Search and Rescue	NOAA		S&R	S&R (may be on a small sat)



Bright Future for Weather Satellites

And they are bright on the sky:

Photo copyright Dieter Klaes



Metop-A Flare:
photographed on 18
Sept 2010 in Darmstadt,
10sec shutter speed

flare = sunlight
reflection on ASCAT
antenna