EUMETSAT NEWS

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EUMETSAT

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

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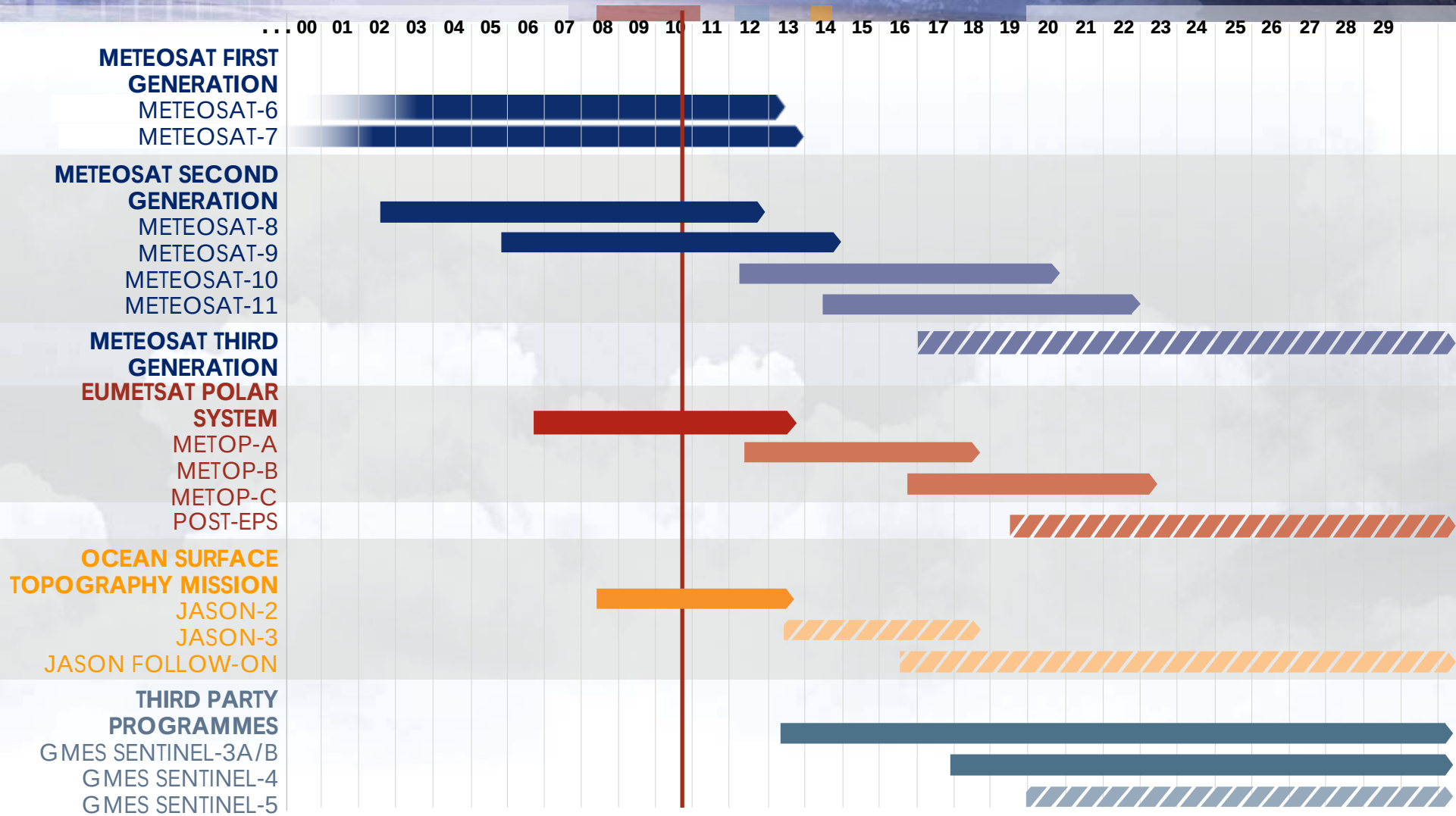
EUMETSAT Space Segment



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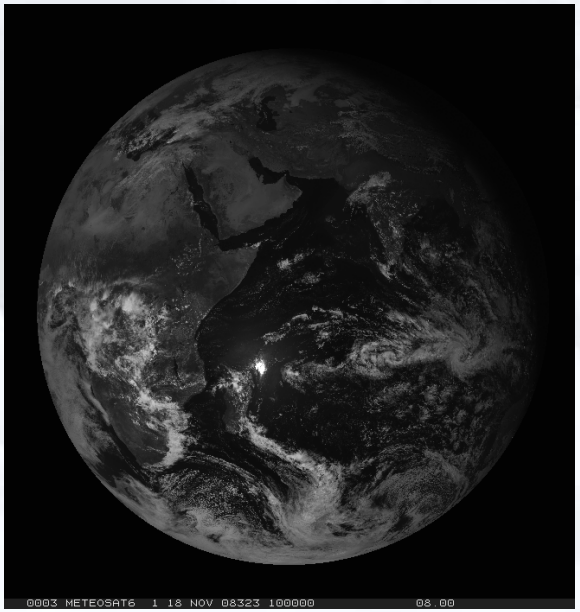
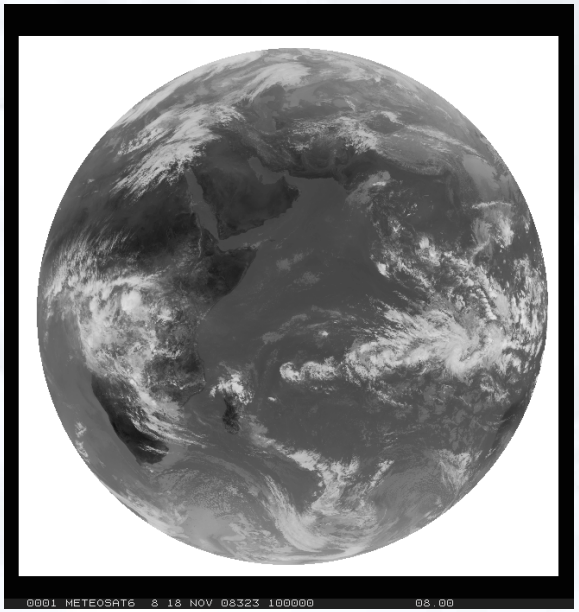
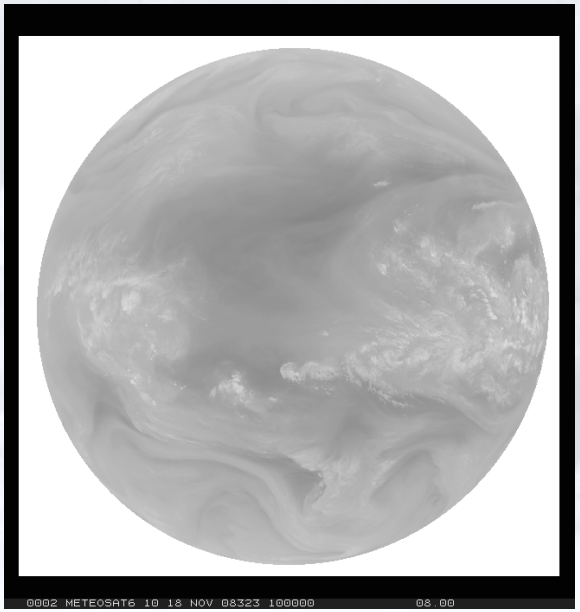
Meteosat First Generation

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







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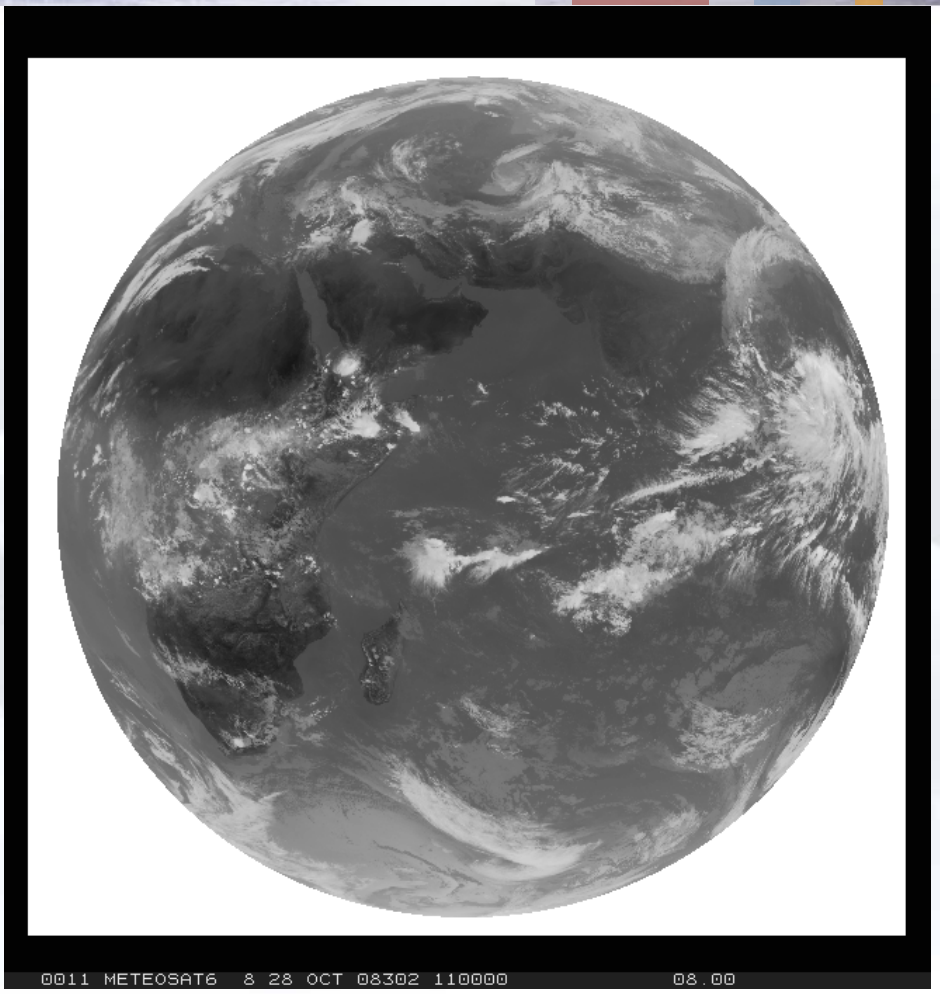
Meteosat-6: An Interesting Case



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

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MSG – Operational Service since 2004

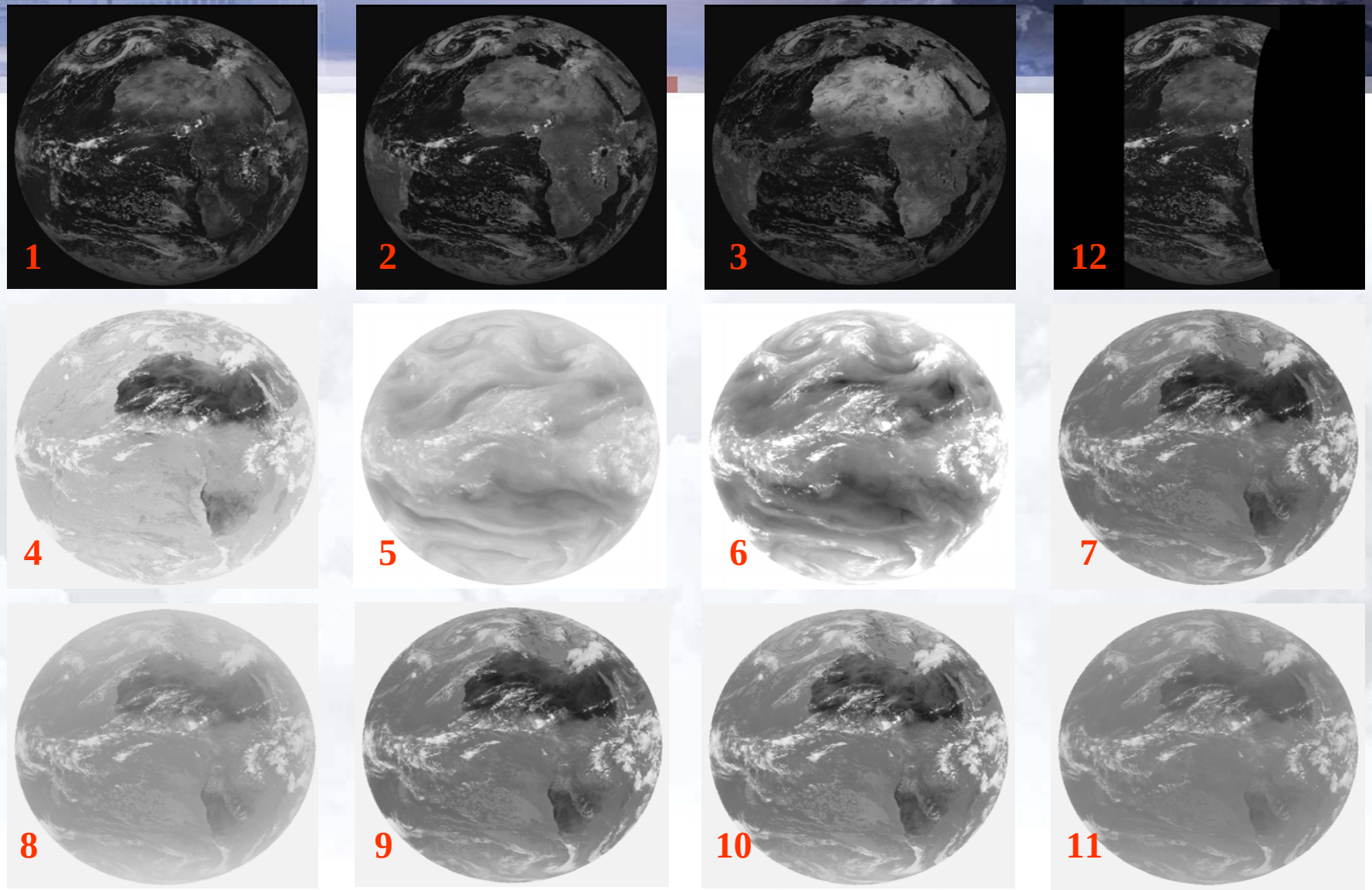
Meteosat-8: stand-by satellite, over 10 E, currently in "rapid scan" mode

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



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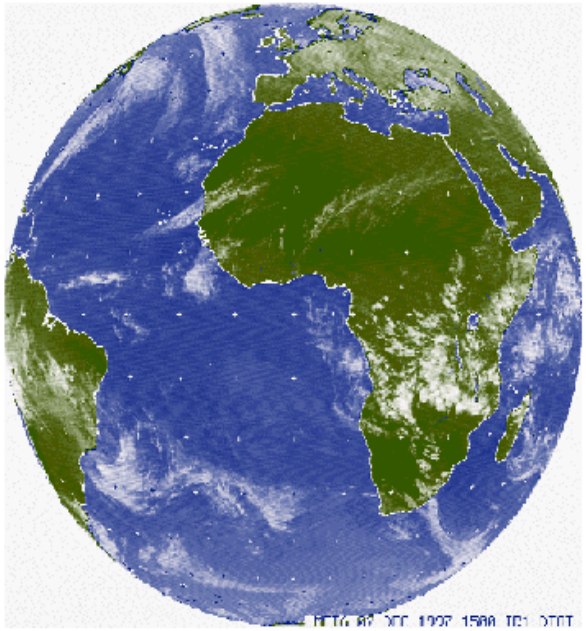
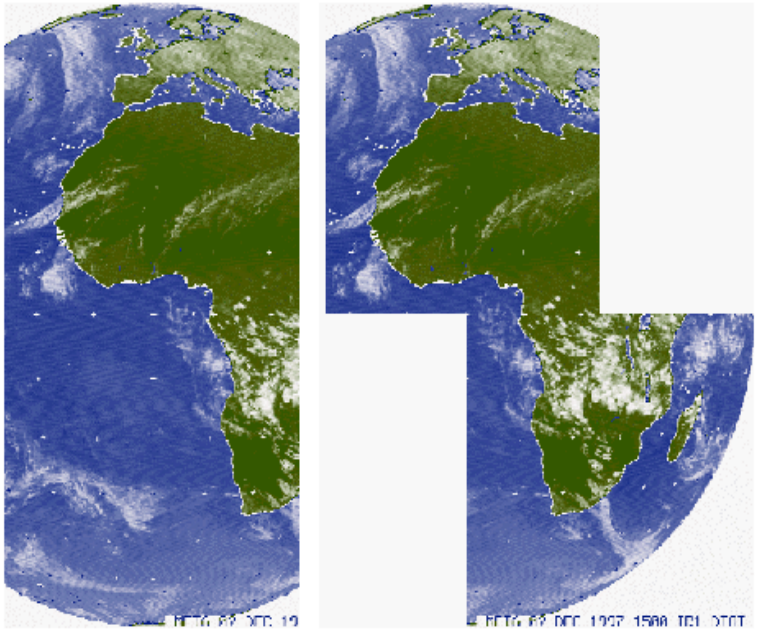
HRV: A Special Case

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





(current setup)

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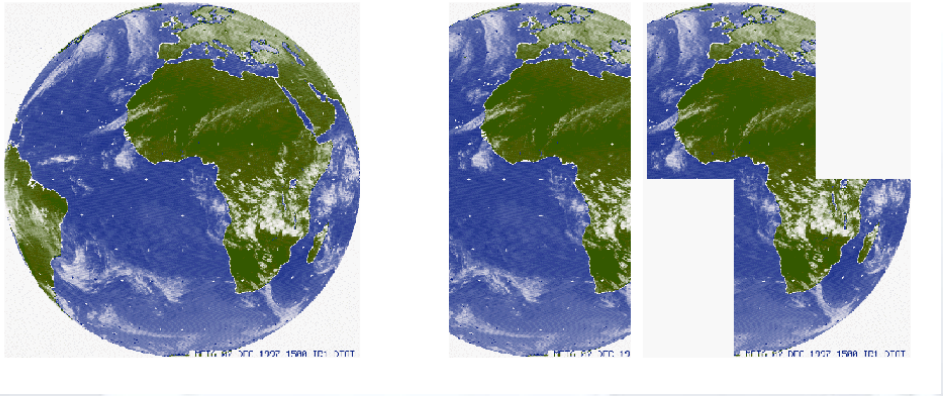
HRV Coregistration with other Channels



Full disk:
3712 Lines
3712 Elements per line

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

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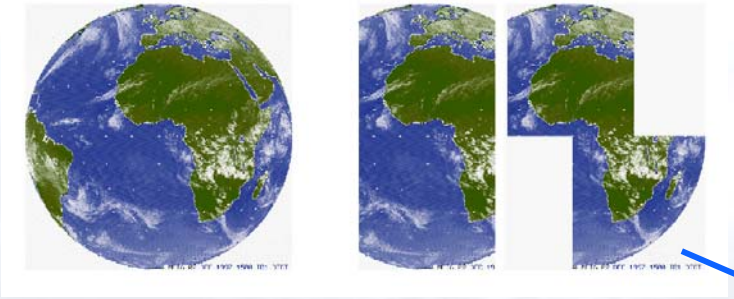
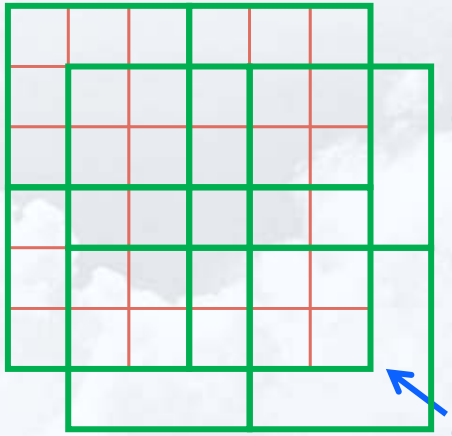
HRV Coregistration with other Channels



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)

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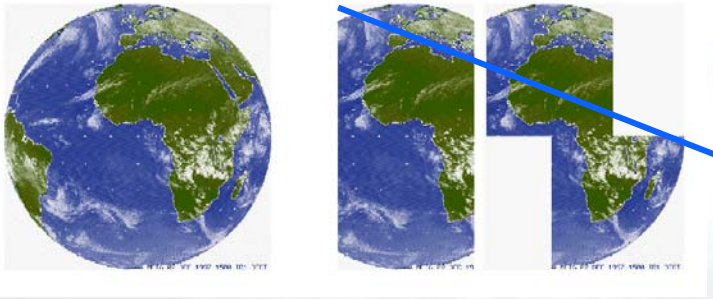
HRV Coregistration with other Channels



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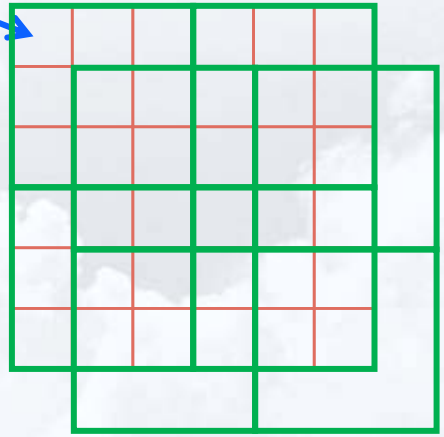
HRV:
3712 * 3 = 11136 Lines
(3712 * 3) / 2 = 5568 Elements

NW Corner – McIdas (1,1):



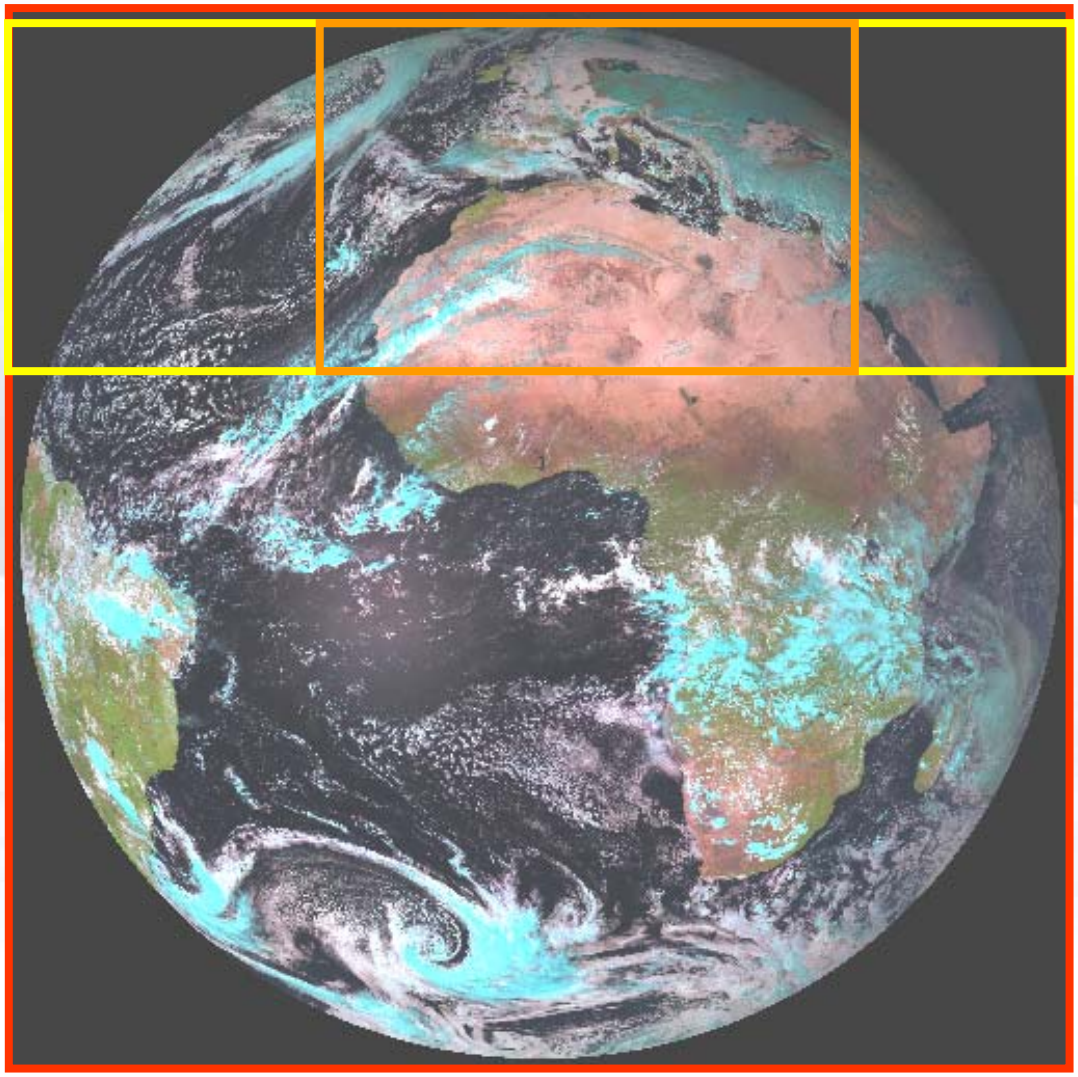
HRV 1 km

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

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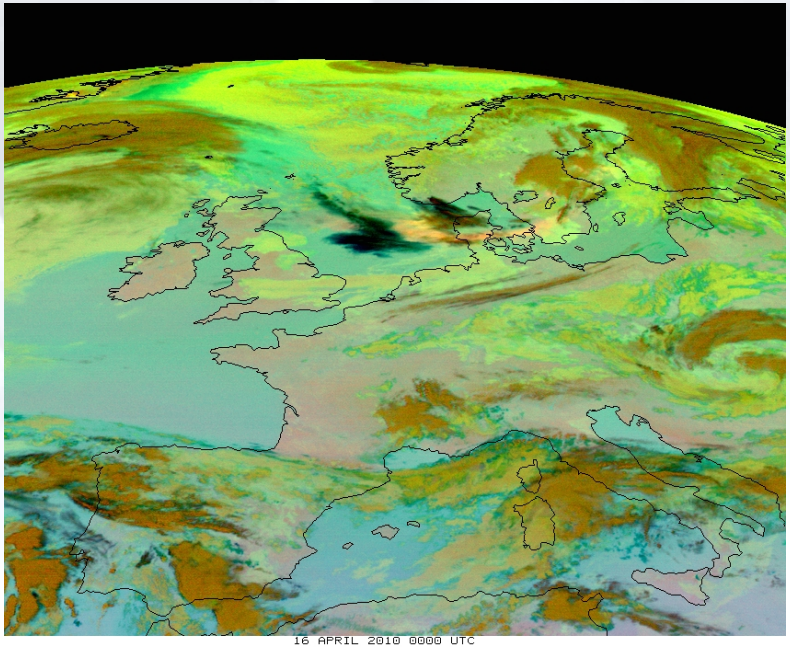
MSG Benefits

Long list of NWP and Nowcasting applications

Hot topic in 2010: Volcanic Ash from Eyjafjalla eruption



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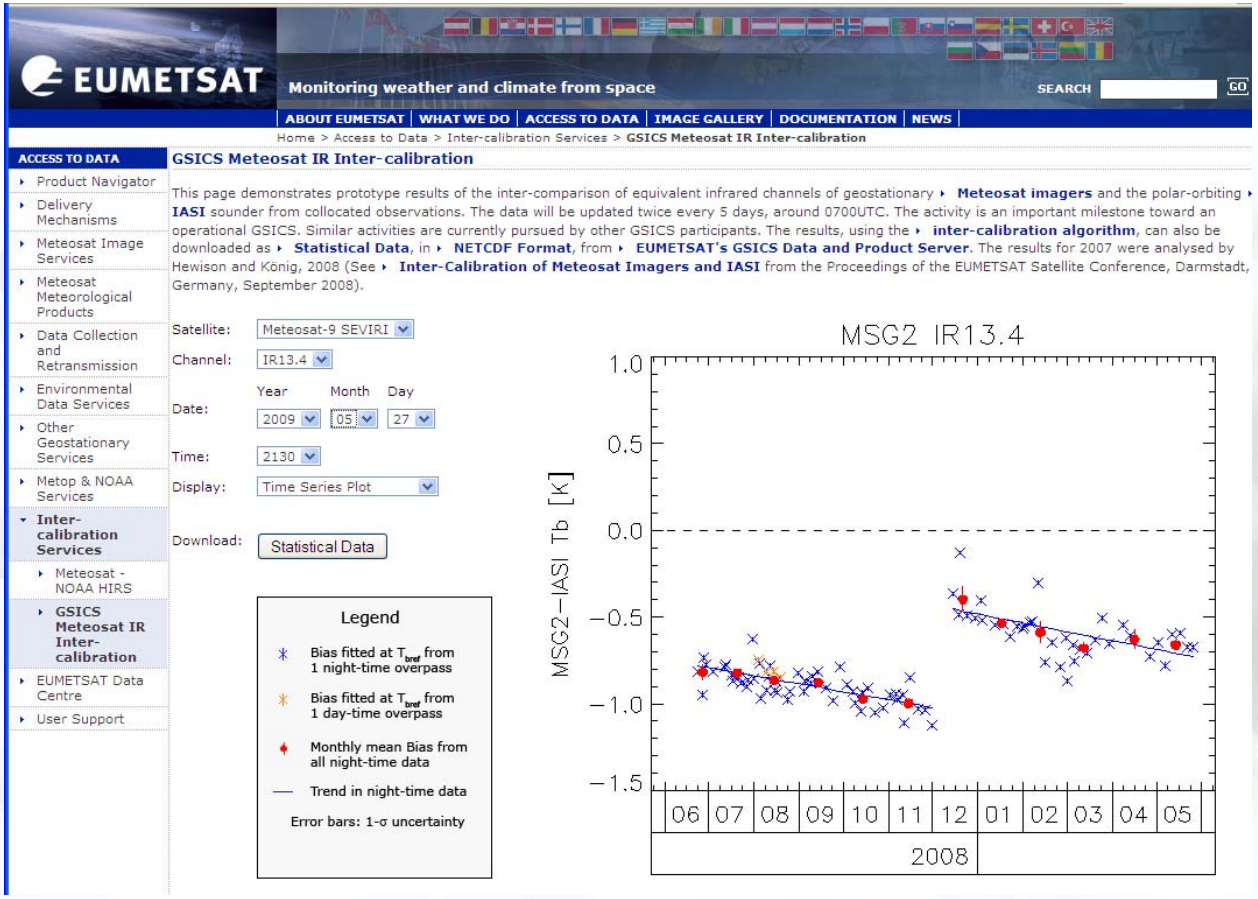
MSG Calibration: GSICS

One GSICS Product:
Daily cross-calibration to IASI



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

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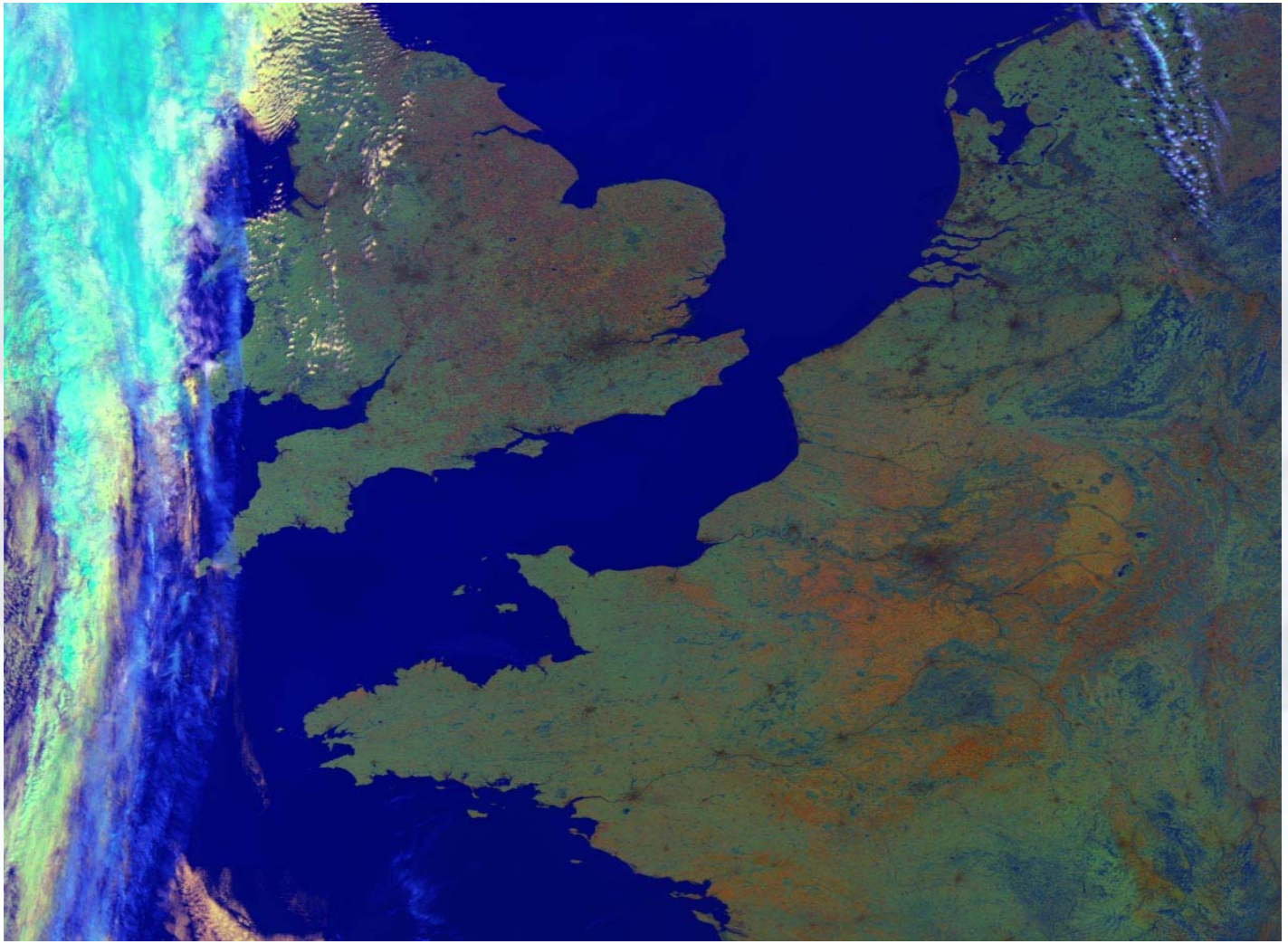
European Polar System EPS

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



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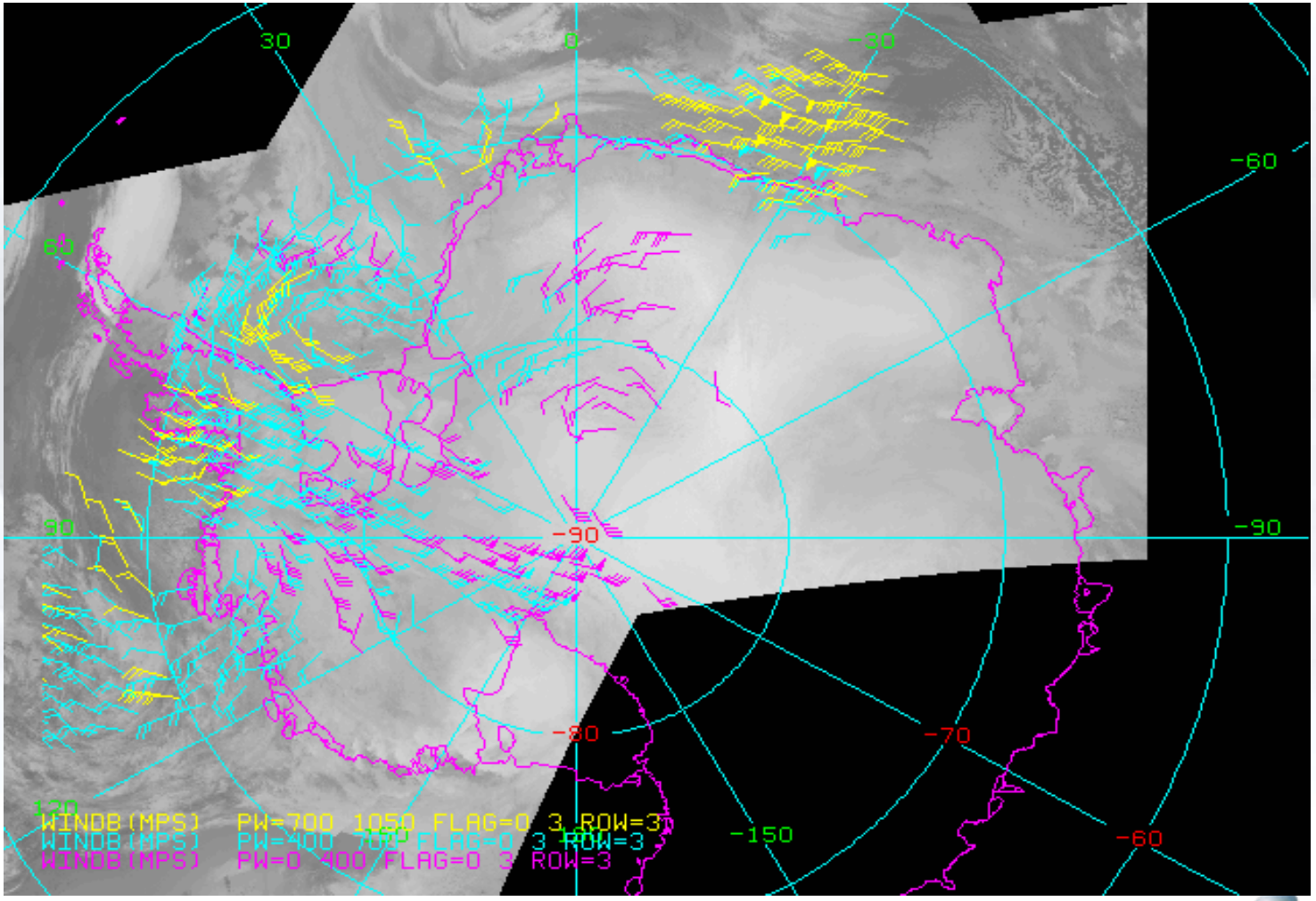
Polar Winds from AVHRR



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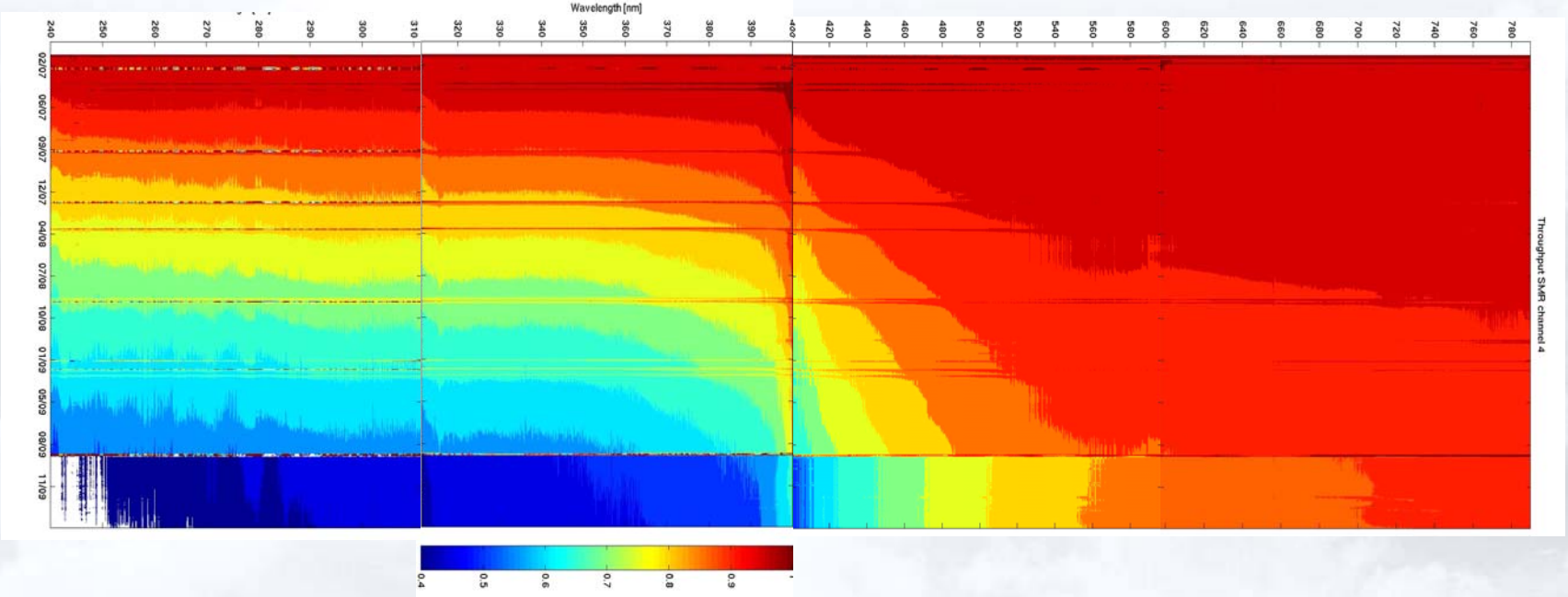
GOME: Sensitivity Loss since Launch

Wavelength: 240 – 780 nm in ~4000 channels

Time since Launch



40 – 100% Throughput

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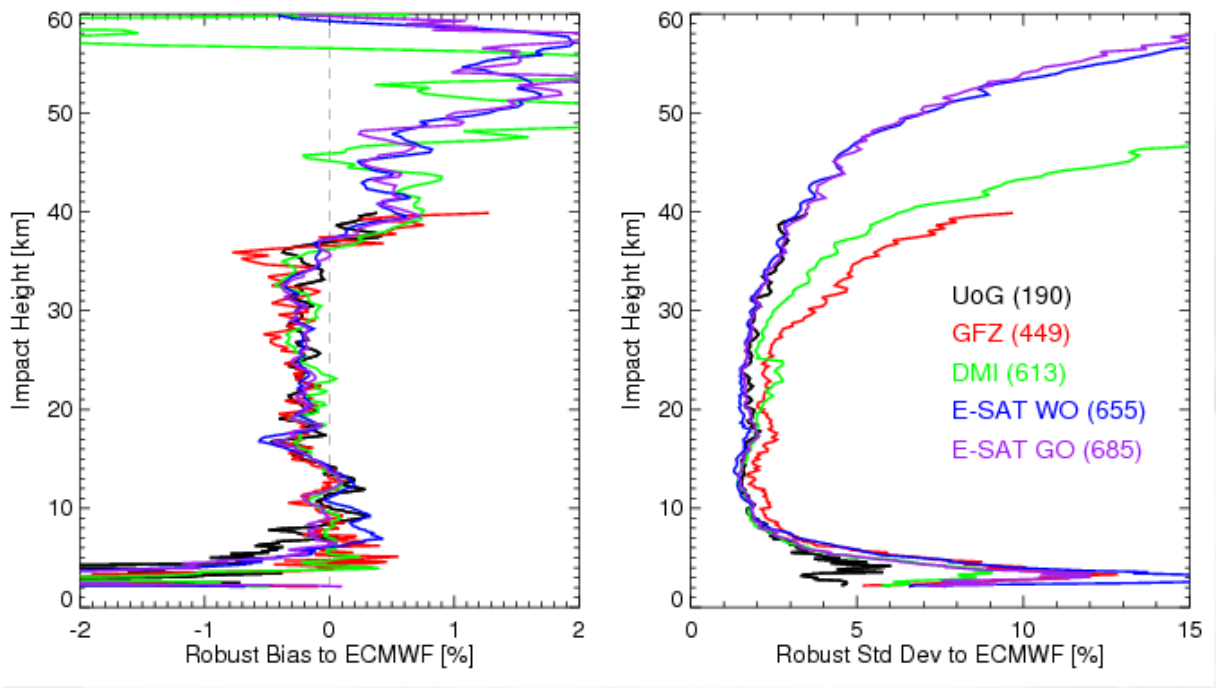
GRAS – Radiooccultation Instrument



Ongoing:
Update of processing software to wave optics:

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

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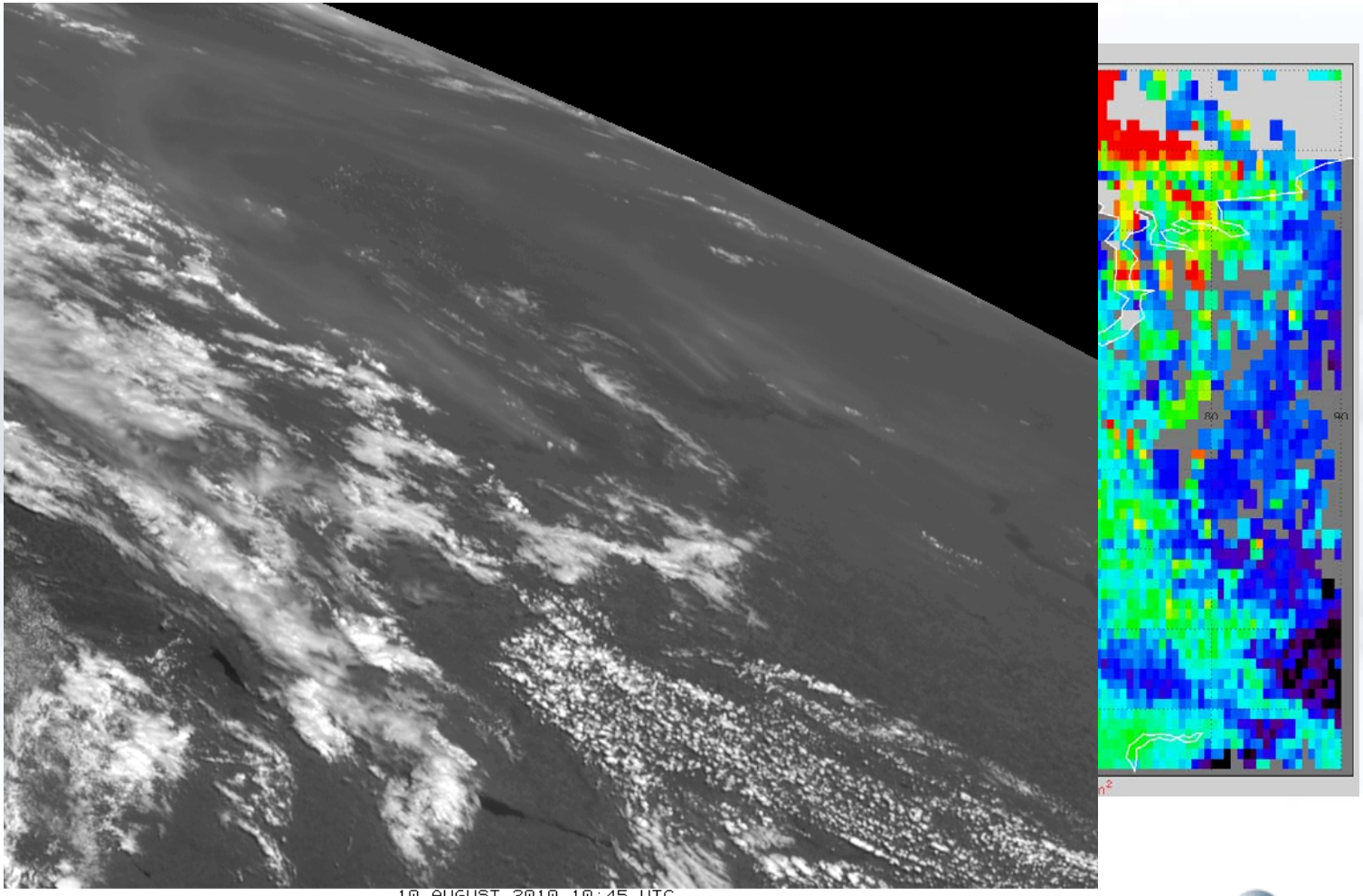
IASI: CO Retrievals – Russian Fires in 2010



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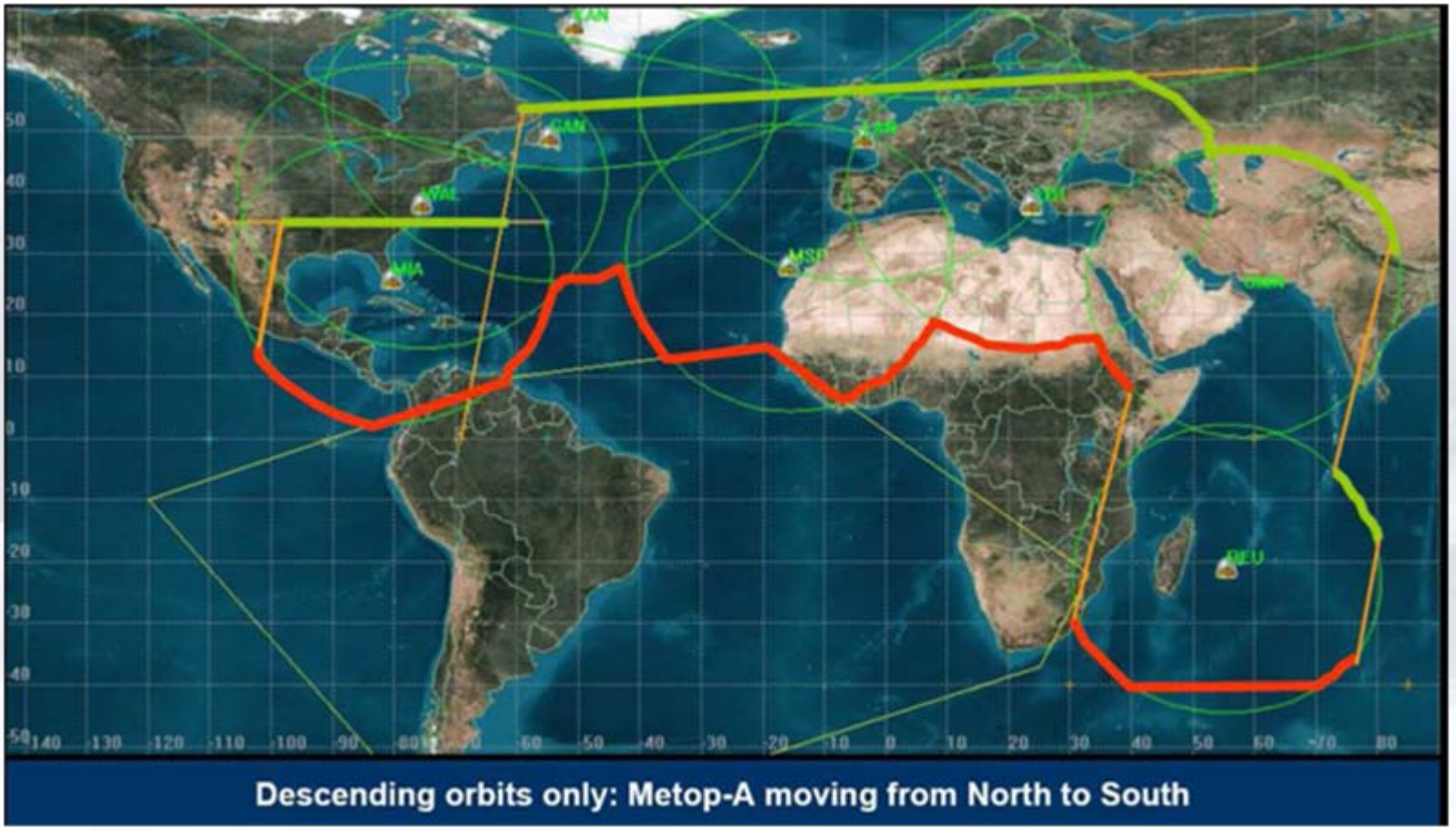
Metop HRPT Zones



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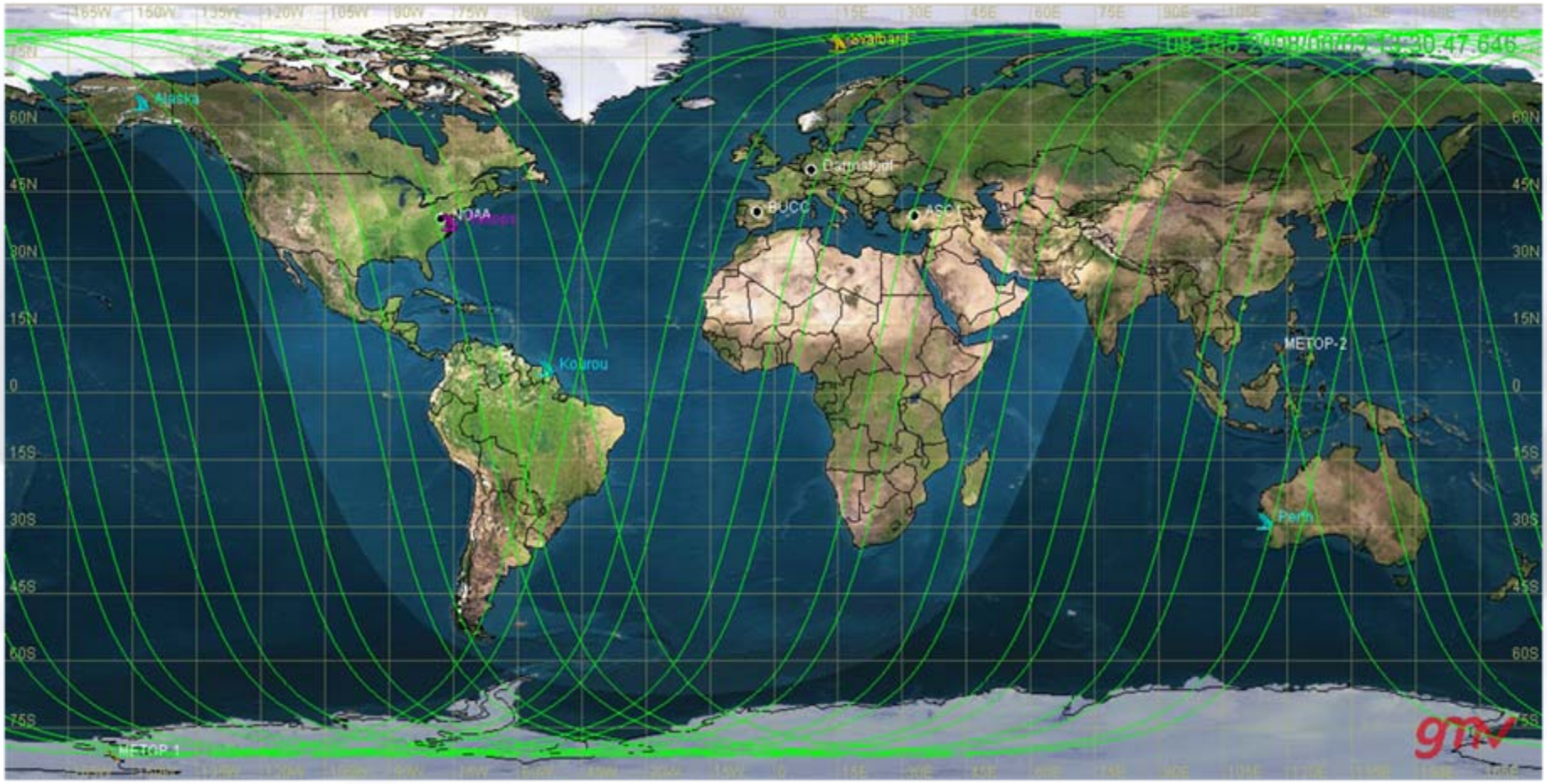
Metop-B: 48 min Separation to Metop-A



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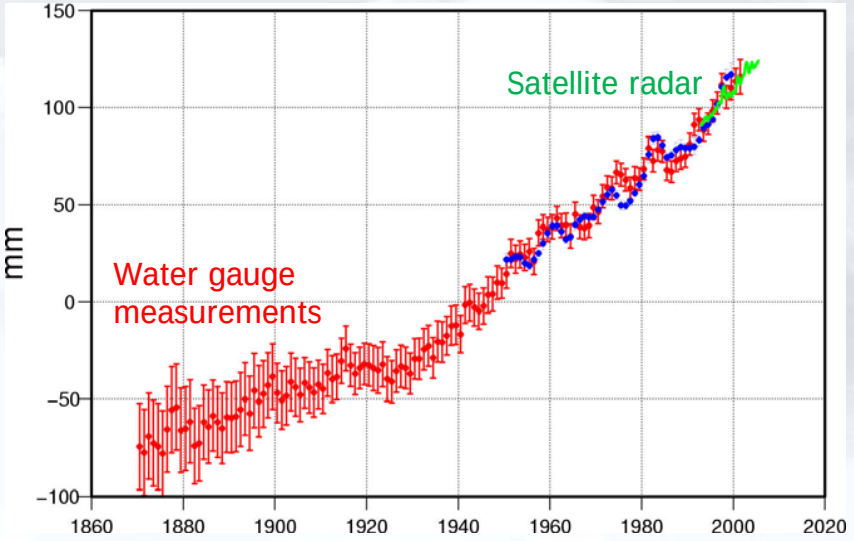
JASON-2: EUMETSAT – NASA – NOAA - CNES

Launched in 2008
Main payload: ocean surface altimeter
To be continued through JASON-3 (2011-2013) and Sentinel-3 beyond 2013



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Future: Meteosat Third Generation

Twin Satellite Configuration, 3-axis stabilised platforms:

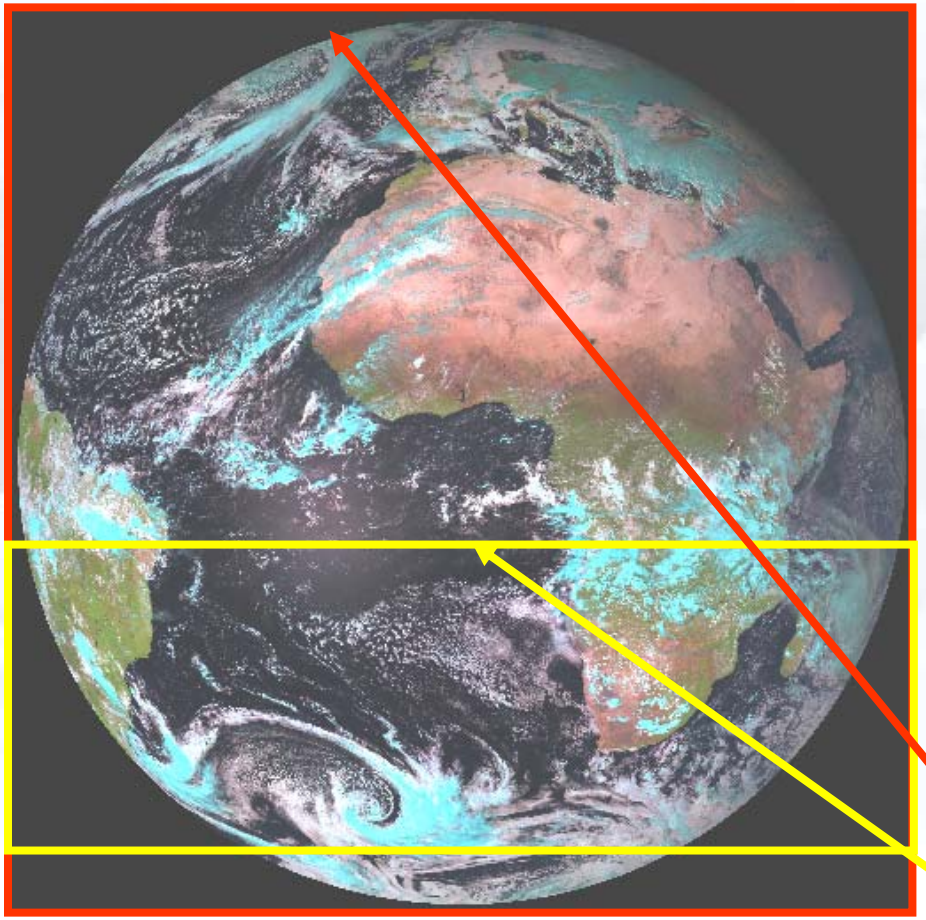
MTG-I: Imager Satellite carrying the FCI instrument (Flexible Combined Imager), the Lighning Imager (LI) and the Data Collection and SAR packages

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

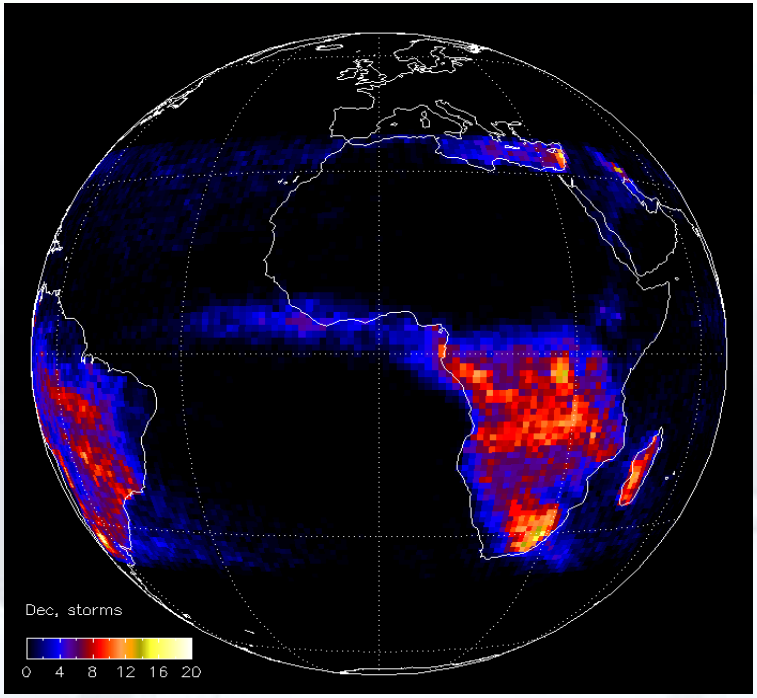


Launch of first MTG-I anticipated for 2016,
second MTG-I in ~2022
(I3 in 2025, I4 in 2029)

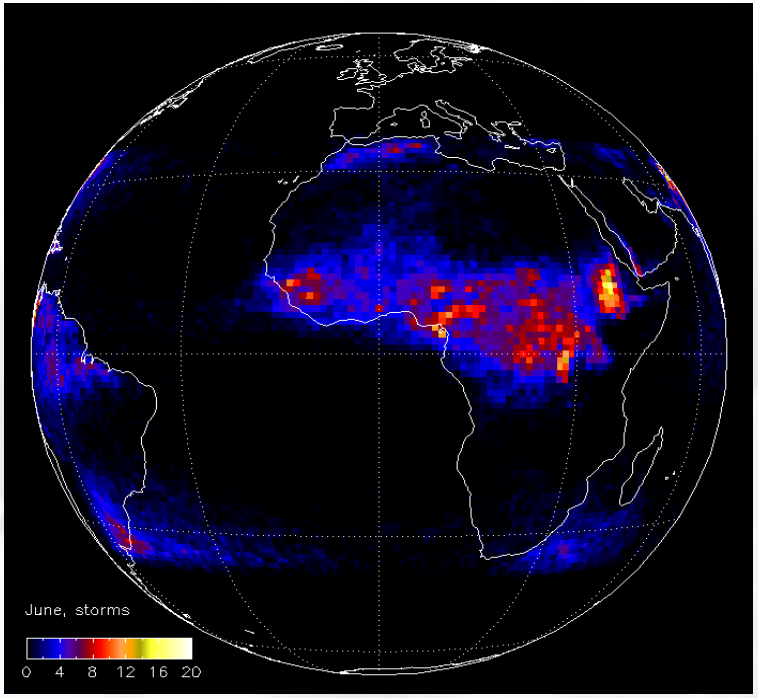
16 channels, spatial resolution between 0.5 and 2 km

	Coverage	Repeat cycle
Full Disk Coverage	18^{o}x18^{o}	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

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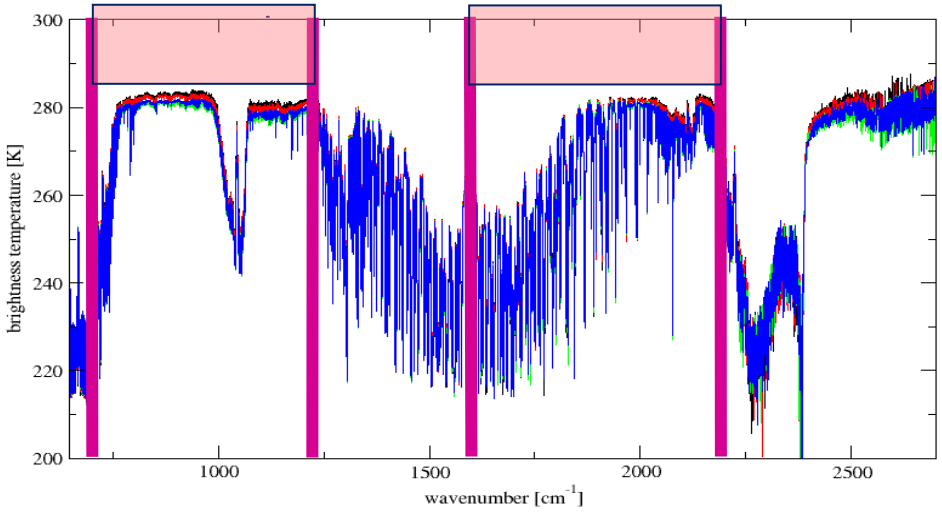
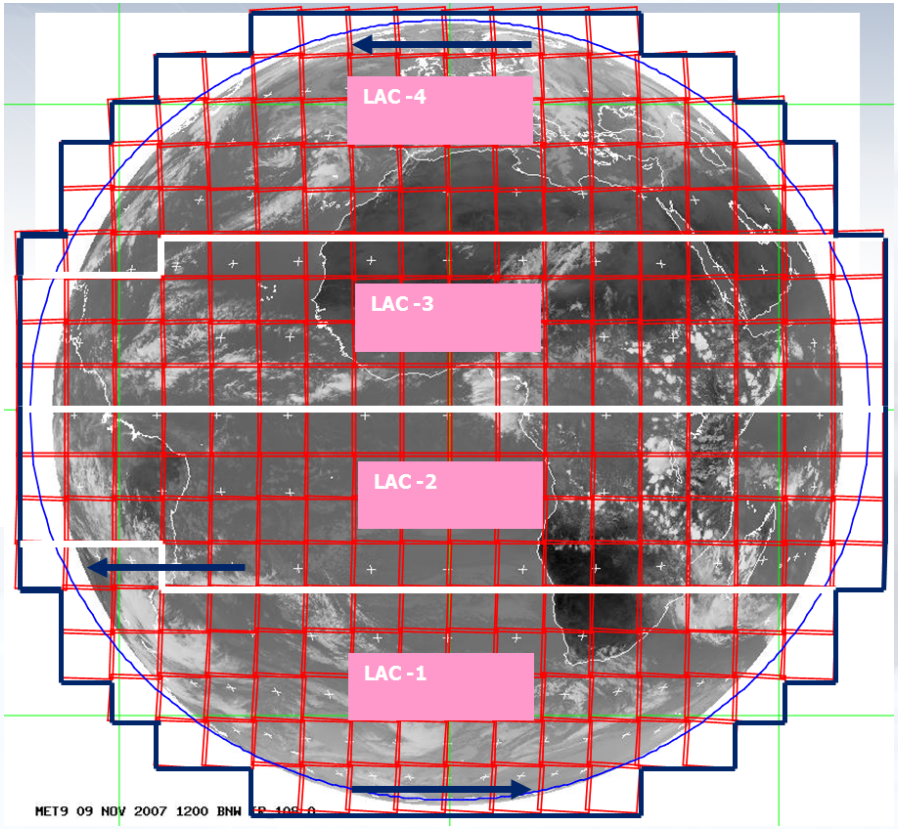
MTG-S





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

Spatial resolution at nadir: 4km

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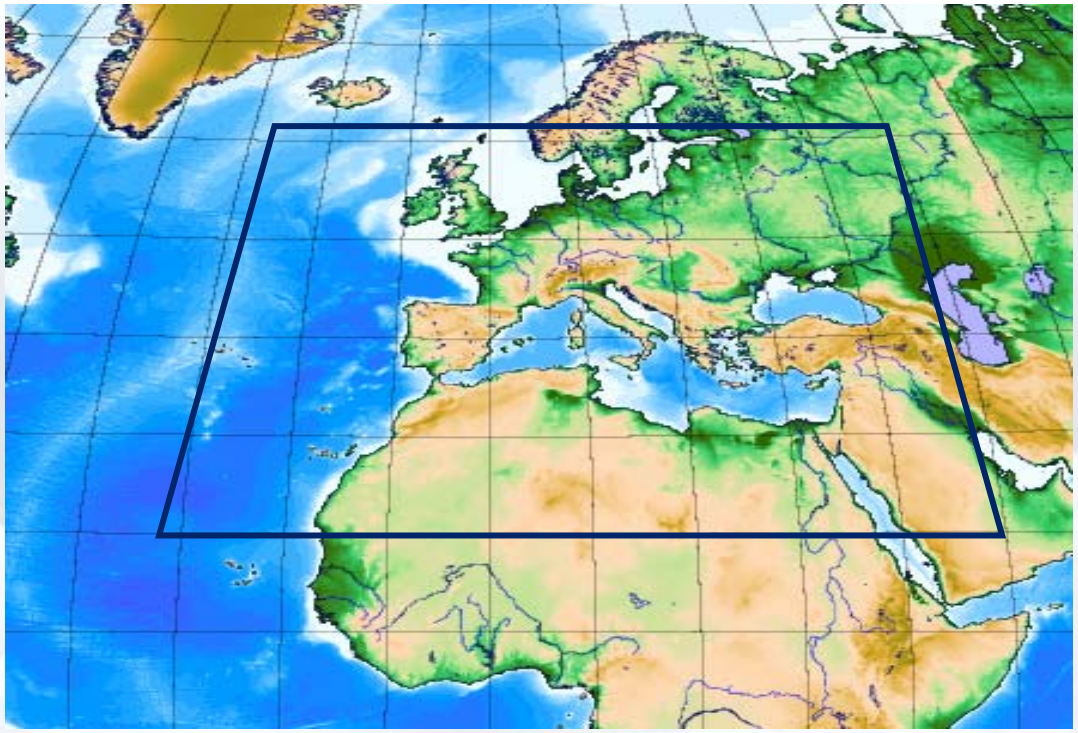
MTG-S UVN Sounder



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.

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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

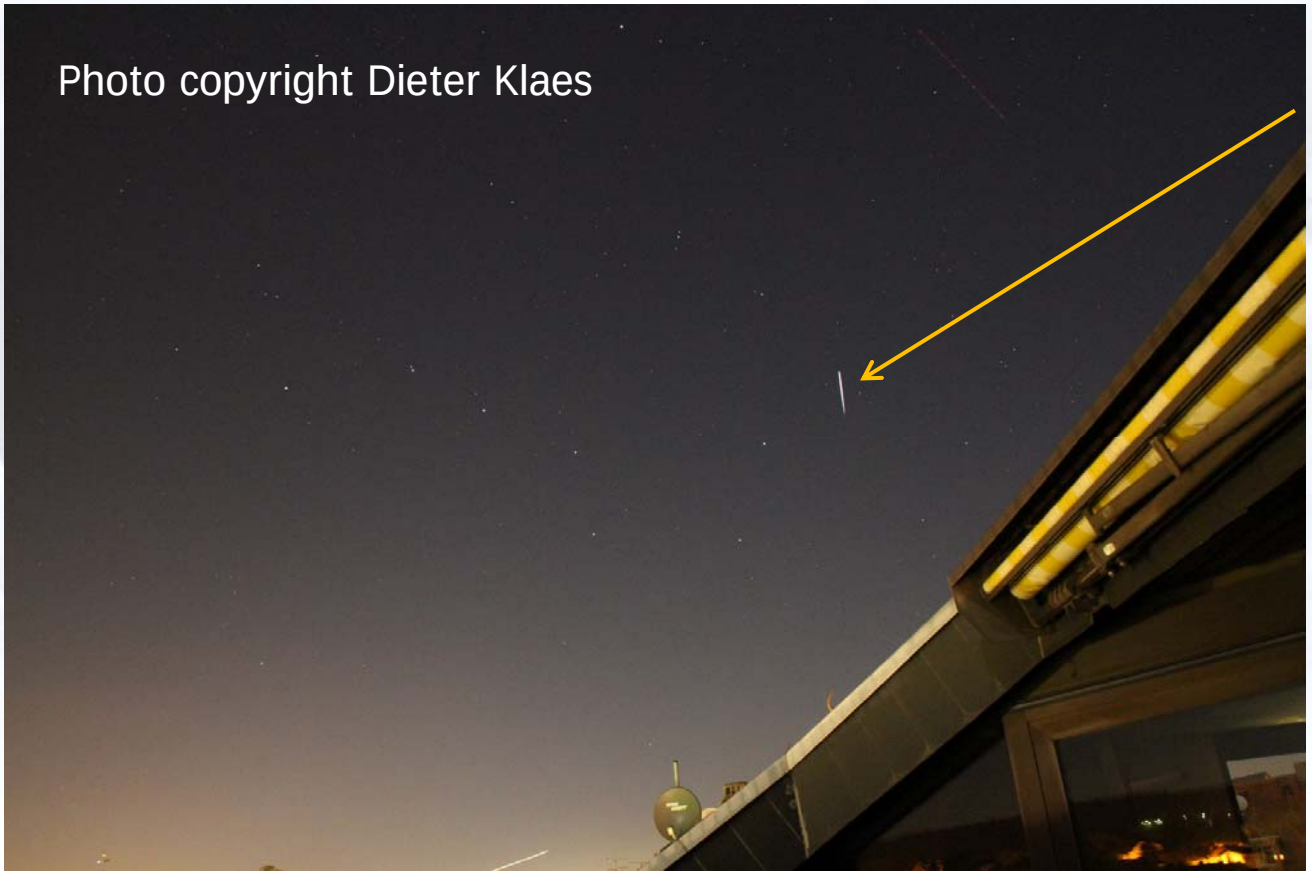
JPS Notional Assignments

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)		VIIRS
	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:



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

flare = sunlight reflection on ASCAT antenna

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