

MTG Africa satellites and services

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COMPLETE UPGRADE OF EUROPEAN METEOROLOGICAL SATELLITE FLEET 2023-2026

METEOSAT THIRD GENERATION (MTG)

EUMETSAT POLAR SYSTEM – SECOND GENERATION (EPS-SG)



Status: February 2026

Current EUMETSAT satellites (10)

SENTINEL-3A & -3B (98.7° incl.)

Low Earth, sun-synchronous orbit
Copernicus satellites delivering marine data services from 814km altitude

JASON-3 (63° incl.)

Low Earth, non-synchronous orbit
Copernicus ocean surface topography mission (shared with CNES, NOAA, NASA and Copernicus)

Sentinel-6 Michael Freilich (66° incl.)

Low Earth, non-synchronous orbit
Copernicus ocean surface topography mission (shared with NASA, NOAA, ESA and Copernicus with support from CNES)

METEOSAT-10, -11

Geostationary orbit
Meteosat Second Generation

Two-satellite system
Full disc imagery mission (15 mins)
(Meteosat-11 (0°))
Rapid scan service over Europe (5 mins)
(Meteosat-10 (9.5° E))

METEOSAT-9 (45.5° E)

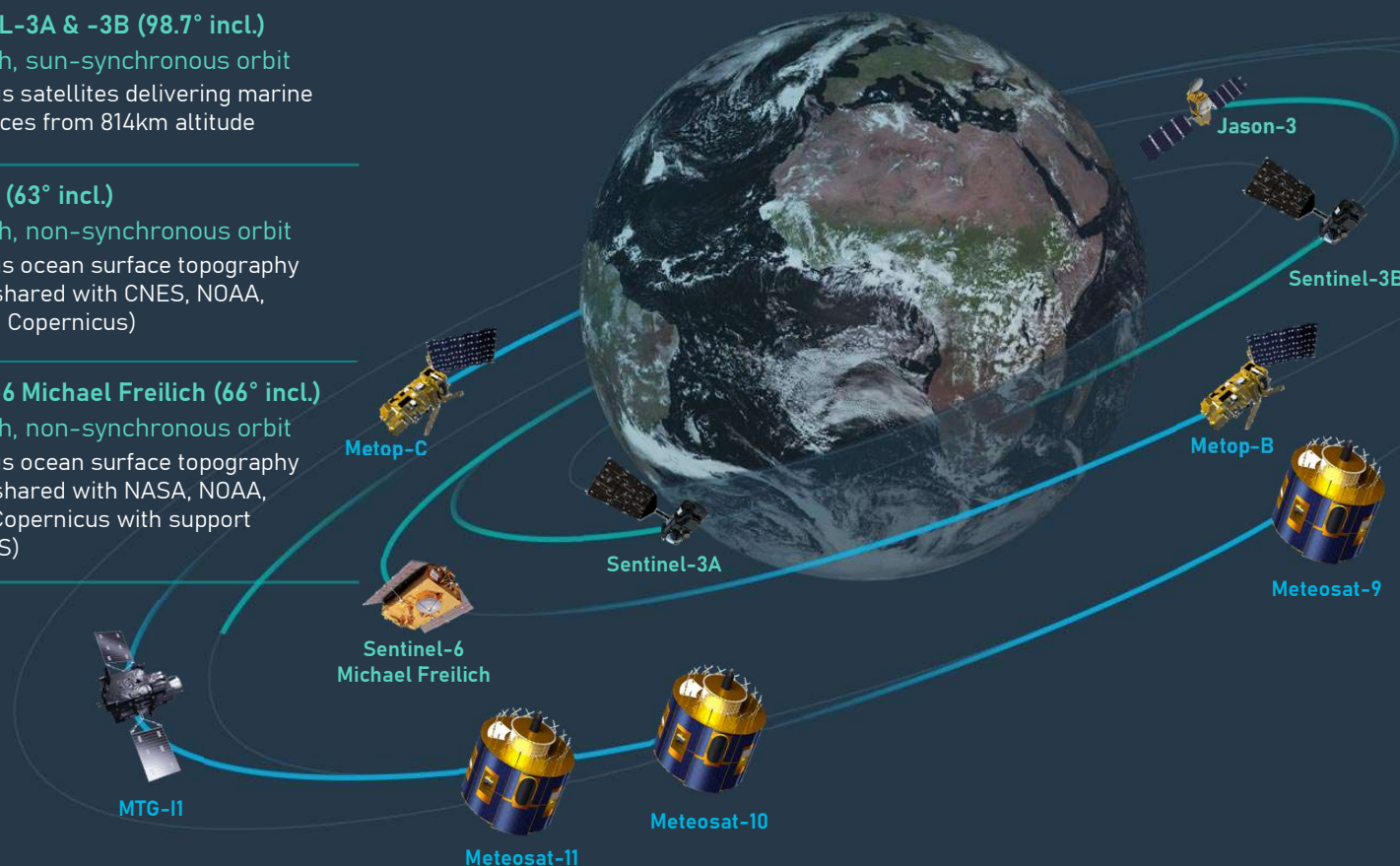
Geostationary orbit
Meteosat Second Generation
providing Indian Ocean data coverage

METOP-B & -C (98.7° incl.)

Low Earth, sun-synchronous orbit
EUMETSAT Polar System (EPS)/
Initial Joint Polar System

MTG-11

Geostationary orbit
Meteosat Third Generation imaging mission,
currently in commissioning phase





MTG Mission Objectives

MTG-11

Full Disc image service

- 16 spectral channels over Europe and Africa every 10 minutes
- Lightning Imager

MTG-S

Full Disc sounding service

- Hyperspectral Infrared Sounder
- Copernicus Sentinel-4 UVN

MTG-I2

Rapid Scanning Service

- 16 spectral channels over Europe every 2.5 minutes

Primary mission:

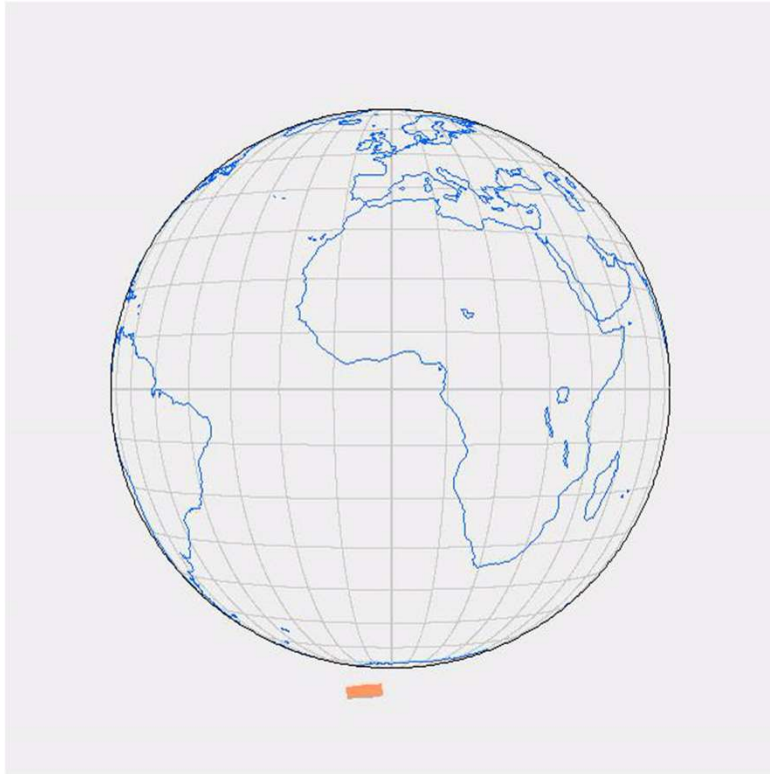
- **Support Nowcasting/ Short Range Forecasting of high impact weather**
 - This is achieved through:
 - Continuity and enhancement of MSG imagery
 - Addition of a new lightning imaging capability
 - New, innovative infrared hyper-spectral sounding

Secondary mission:

- **Air quality monitoring over Europe**
 - This is achieved through:
 - Synergy between Sentinel-4, Infrared Sounder and Imagery



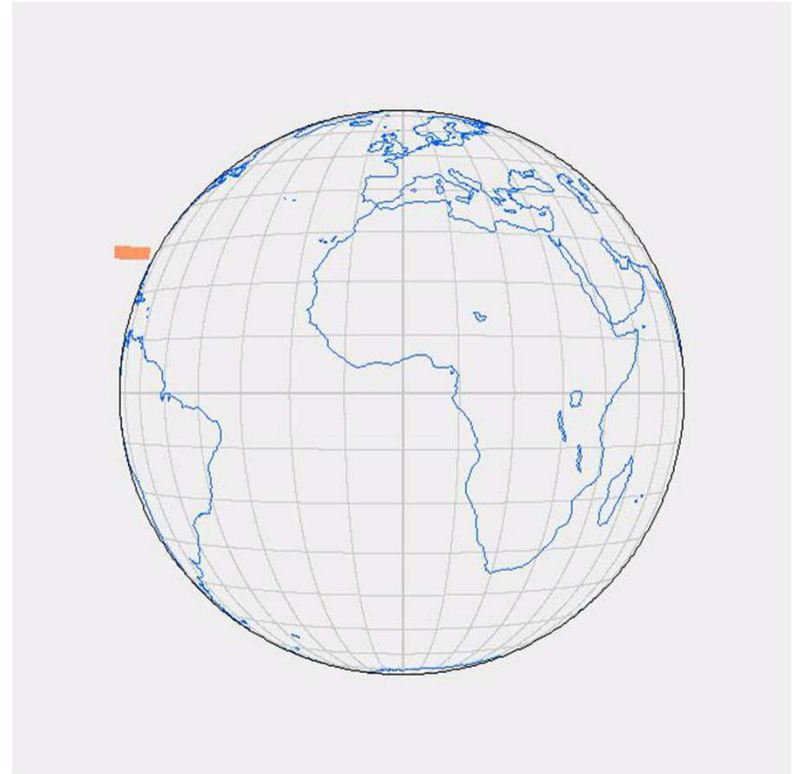
MTG-FCI Scanning



Full Disc Scanning Service (FDSS)

FCI on MTG-I1 - **now**

all channels of the Full Disc every 10 minutes.



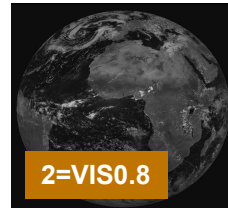
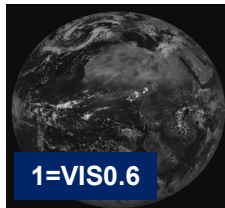
Rapid Scanning Service (RSS)

FCI on MTG-I2 - **from end 2026**

all channels in the top quarter of the Full Disc every 2.5 minutes.

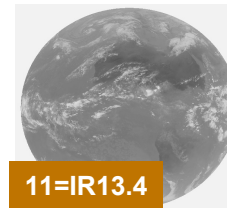
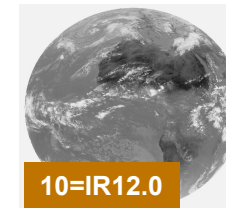
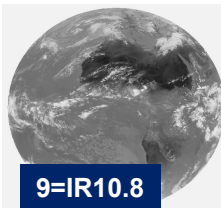
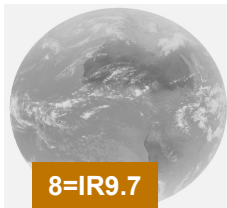
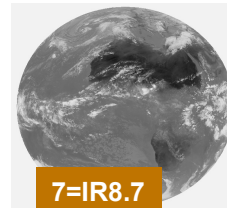
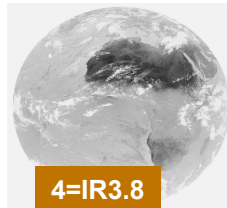
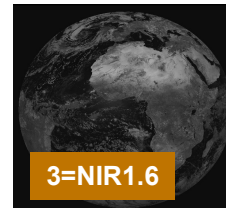


Spectral imagery resolution



HRV channel provided at 1.0 km resolution.

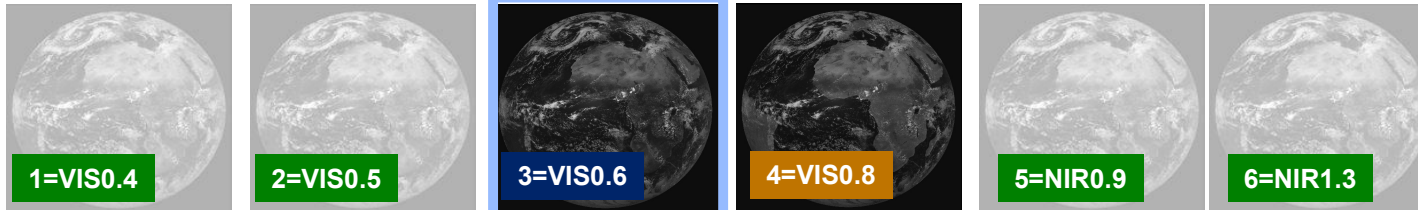
Narrow-band channels provided at 3.0 km resolution.



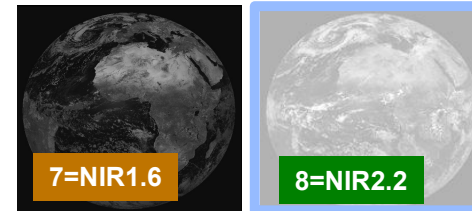
SEVIRI



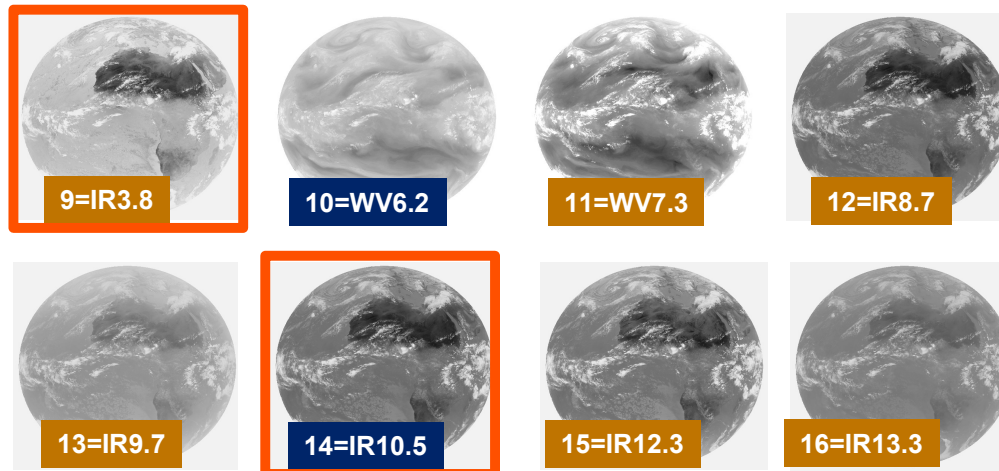
Spectral imagery resolution



Solar channels provided at 1.0 km (& 0.5 km) resolution



Thermal channels provided at 2 km (& 1 km) resolution

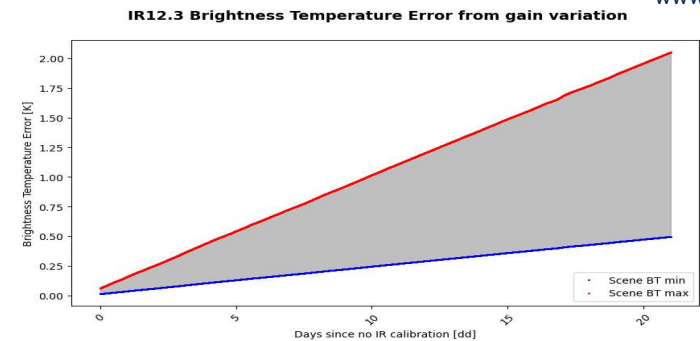


FCI

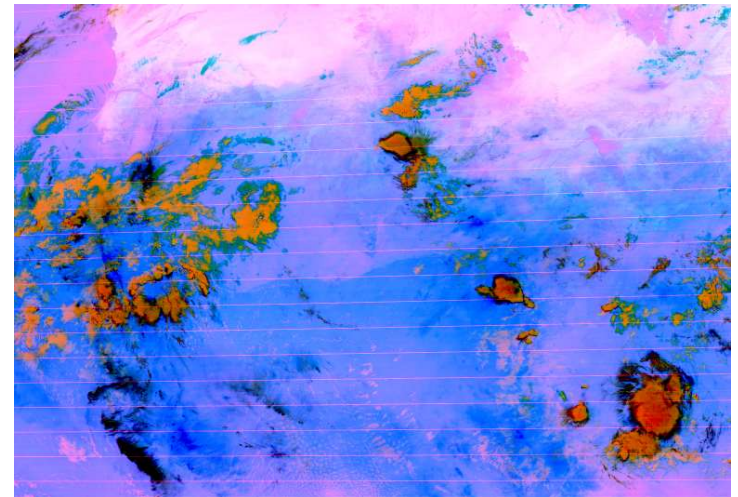
Mitigation of FCI calibration anomaly

- Background: Loss on onboard calibration source
- Main Goal: To keep IR absolute calibration under control and to guarantee an acceptable data quality
- Mitigation: Using EUMETSAT tools (MICMICS), it is possible to retrieve the IR gains with acceptable accuracy and to compensate for the IR channels degradation, by:
 - Use of IASI as a reference instrument to retrieve the absolute average calibration by collocating IASI and FCI in time and space.
 - Statistical derivation of the average gains per channel
 - Quality filtering of retrieved gains
 - Creation of synthetic blackbody measurements
 - Production of synthetically calibrated L1C FCI data

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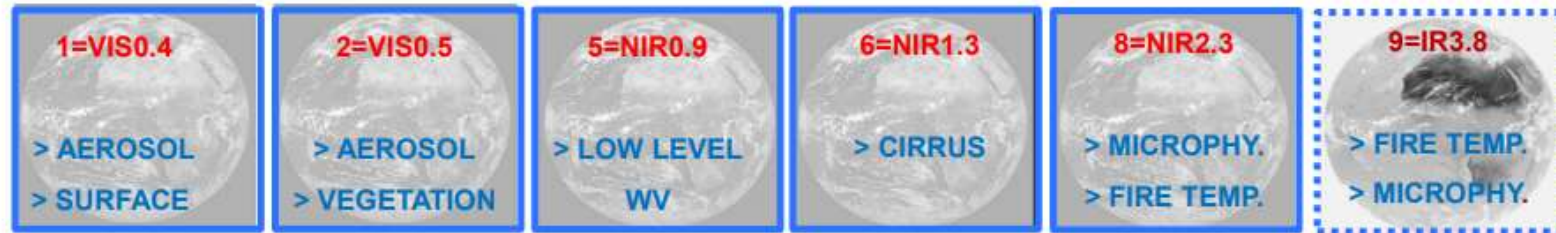
Computed evolution of 12.3 micron channel in case of no calibration at all. It is demonstrated that in the worst-case scenario Brightness Temperatures can drift up to 2 K/month.



FCI Dust RGB product without onboard calibration (R: IR12.3-IR10.5; G: IR10.5-IR8.7; B:IR10.5)



New channels – new RGB combinations



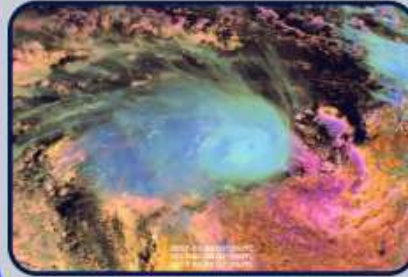
True Colour RGB

R VIS0.6
G VIS0.5
B VIS0.4



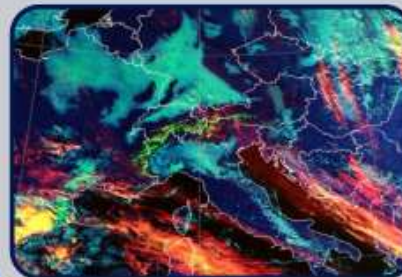
Cloud Phase RGB

R NIR1.6
G NIR2.3
B VIS0.5/VIS0.6



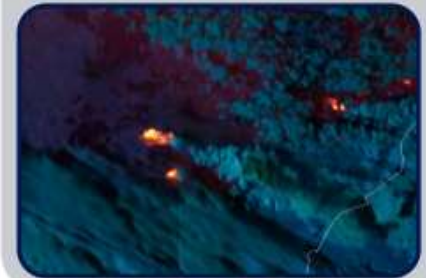
Cloud Type RGB

R NIR1.3
G VIS0.8
B VIS1.6



Fire Temp. RGB

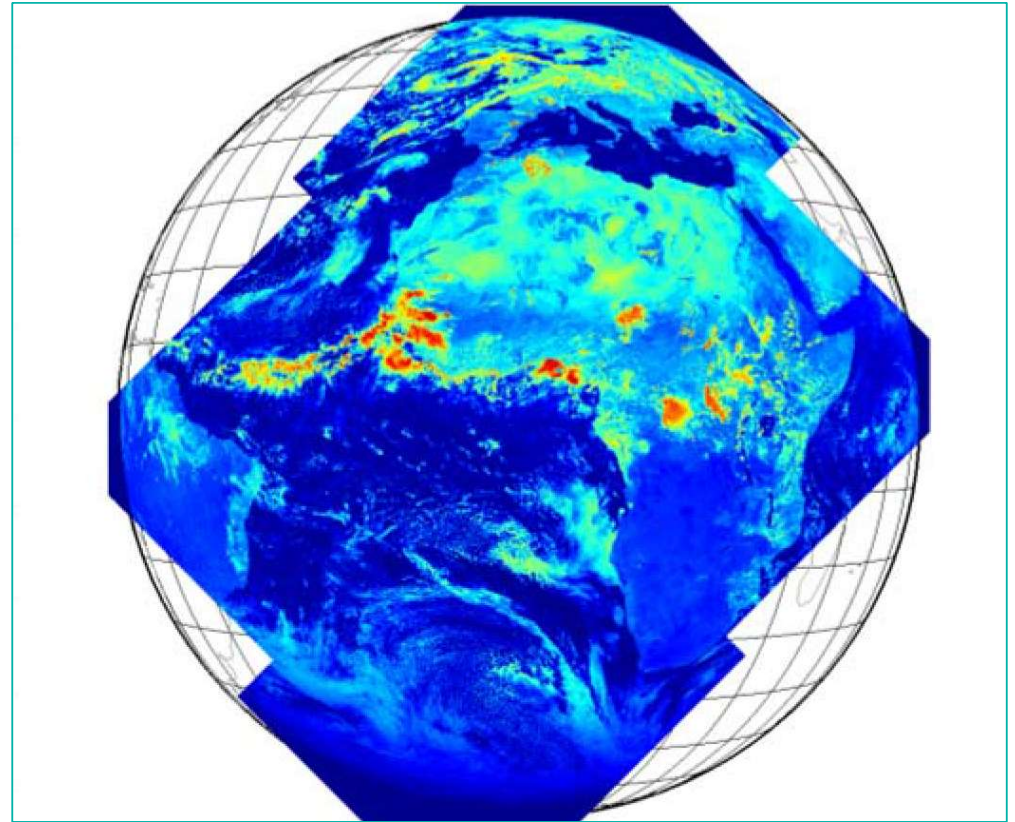
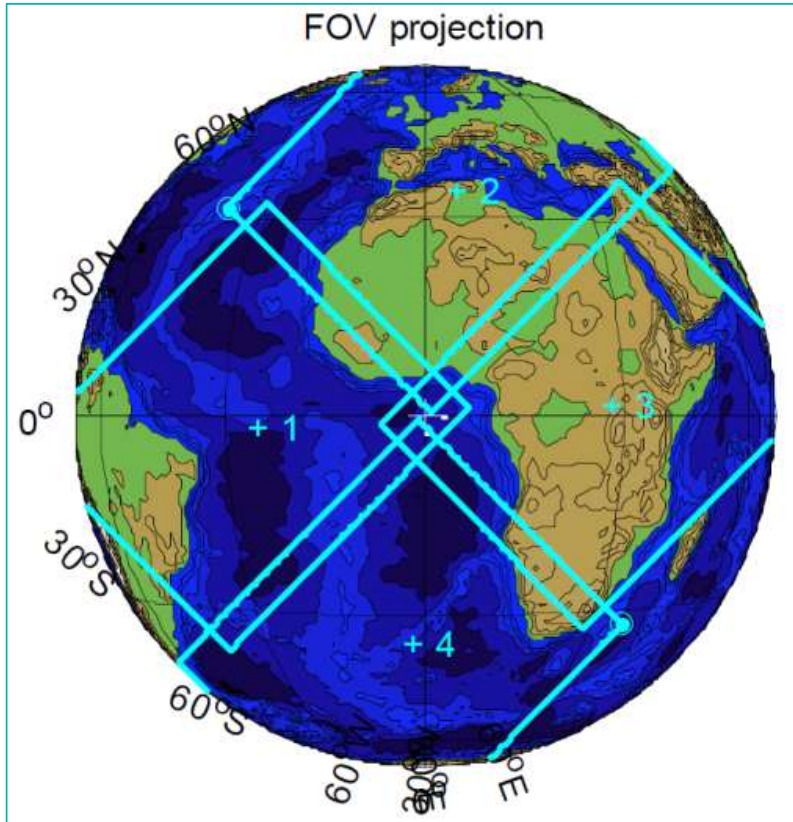
R IR3.9
G NIR2.3
B NIR1.6





- Lightning is a sudden electrostatic discharge between electrically charged regions:
 - of a cloud (intra-cloud lightning or IC)
 - of two clouds (cloud-to-cloud lightning or CC)
 - of a cloud and the ground (cloud-to-ground lightning or CG)
- Total lightning
= cloud-to-ground + intra-cloud lightning
- Lightning is a precursor of severe weather, with a lead time of tens of minutes
- The radiation produced by an electric discharge within or below a cloud reaches the cloud top after multiple scattering through the cloud and is detected by lightning imagers in space
- MTG LI measures total lightning

MTG Lightning Imager field of view





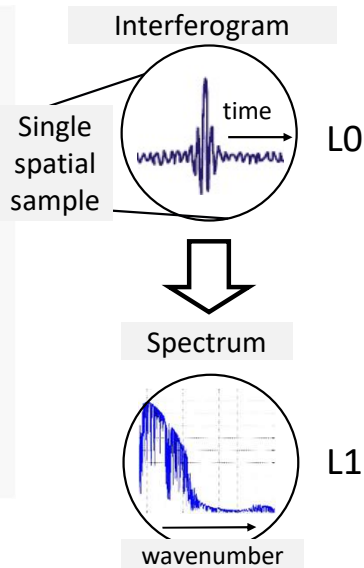
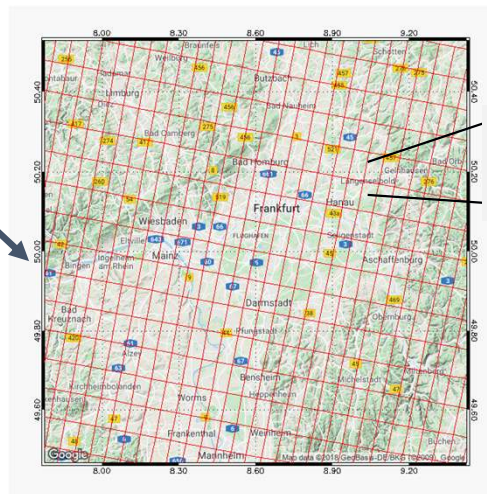
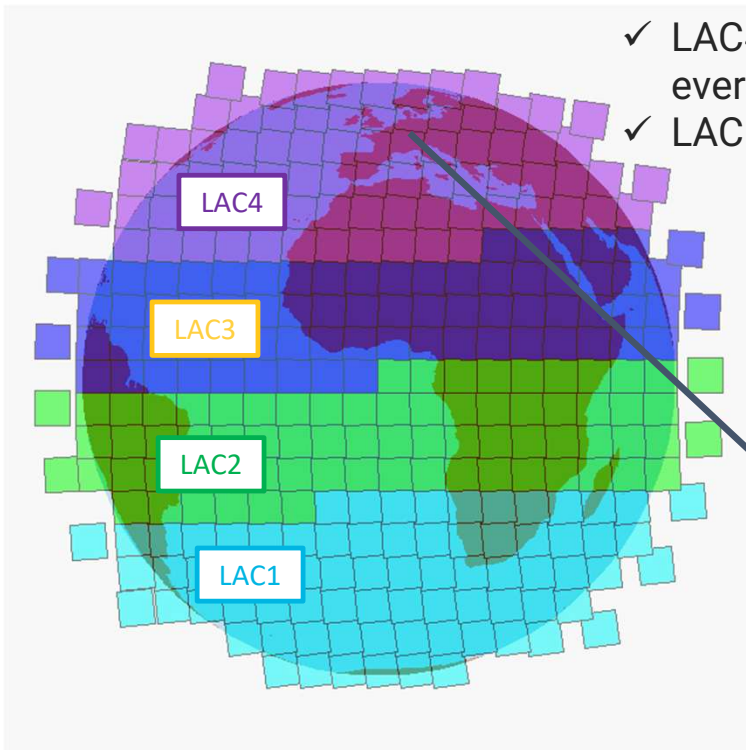
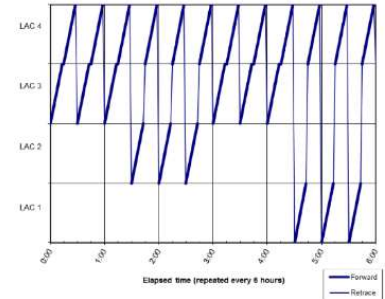
Benefits from LI

- Assimilation in NWP models
- Safety (aviation, shipping, wind/solar farms, recreational)
- Wildfire response
- Climate applications (NO_x production, high-latitude lightning trends)

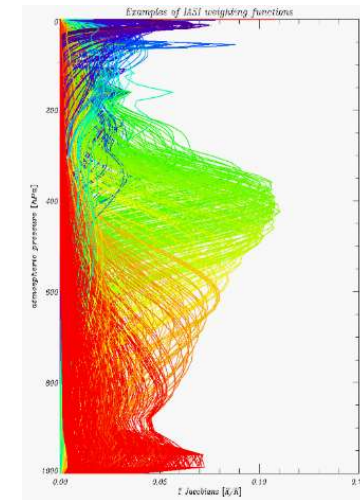
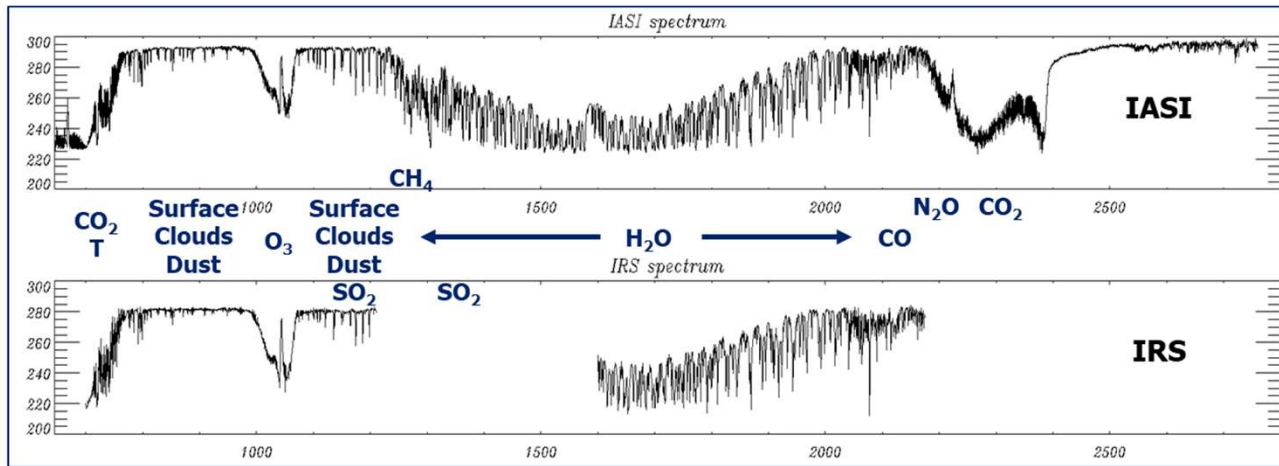
MTG Infrared Sounding mission

- ✓ The Earth disk is split in 4 Local Area Coverage (LAC) zones, each of them covered in 15 min by a succession of “steps and stares” called dwells

- ✓ LAC4 (northern mid-latitudes) will be covered every 30 minutes
- ✓ LAC1, 2, 3 will be alternatively viewed in-between



MTG Infrared Sounding mission



Operational spectro-imagery at high spectral, spatial & temporal resolution:

Two spectral bands: MWIR: 1600 to 2250 cm⁻¹ (4.44–6.25 μm) and LWIR: 680 to 1210 cm⁻¹ (8.26–14.70 μm)

Sampling: 0.6cm⁻¹ spectral, 4km at nadir spatial, 30min temporal over Europe and parts of North Africa



MTG–Africa service on EUMETCast Africa

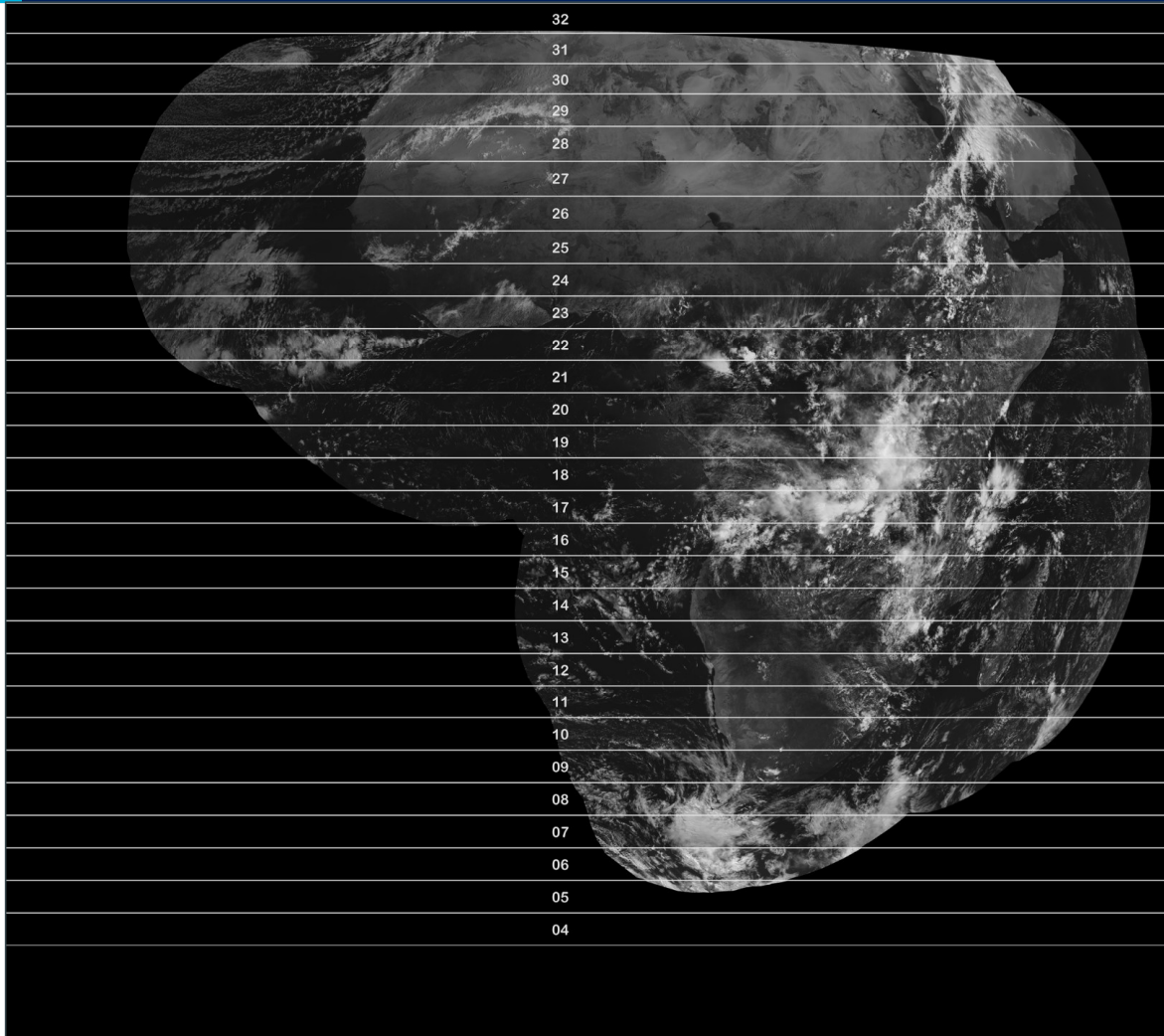
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- Due to EUMETCast Africa bandwidth limitations a reduced MTG service is provided. The initial baseline discussed and agreed with core African user community (WMO RAIDEG)
 - Reduced spatial and temporal FCI channel data
 - A sub-set of FCI level 2 data (incremental)
 - Centrally generated RGBs
 - Single LI product Accumulated Flashes (AFA)
- Following feedback from the core users, we have agreed with our Member States an increase to the EUMETCast Africa bandwidth which will allow us to provide a single Africa regional cut out with full spatial temporal resolution.
- Implementation of the new MTG–Africa service is expected in the September 2026 timeframe.



New MTG-Africa FCI regional cutout

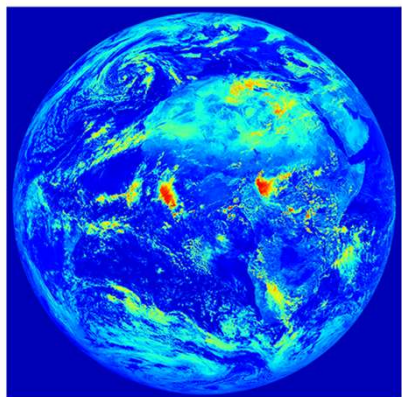
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- 16 channels of FCI 1c data
- Full temporal and spatial resolution (normal resolution)
- The full 16 channels to allow users to generate their own RGBs
- Should allow users to make use of the NWC SAF software
- Available from September 2026



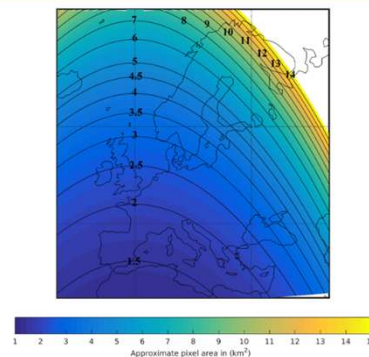
Preparing our users



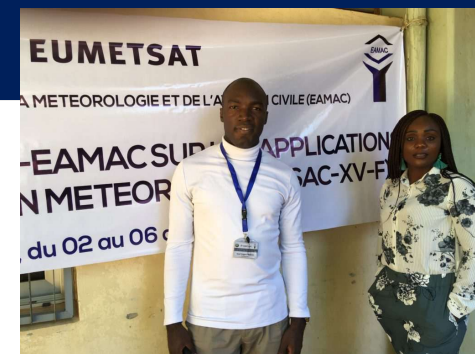
Test data



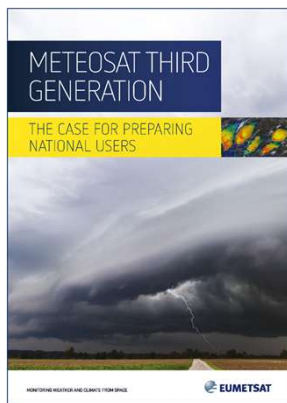
Training testbeds



Product guidance



Training events & expert workshops



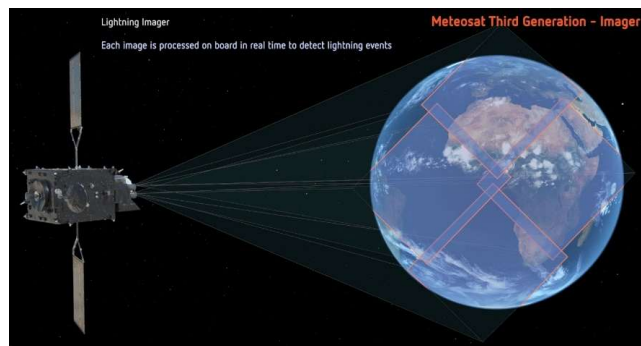
User guidance



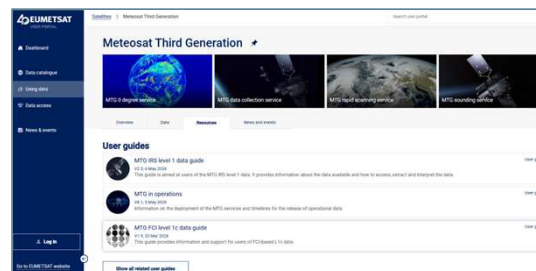
Data access and display



FCI L1c NRT user support



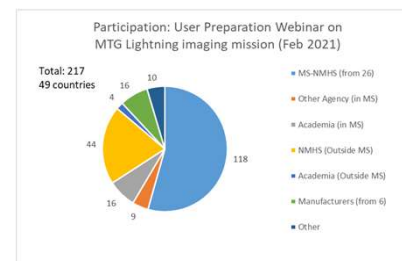
Observation mission videos



User Portal



Open user preparation webinars





Thank you!
Questions are welcome.