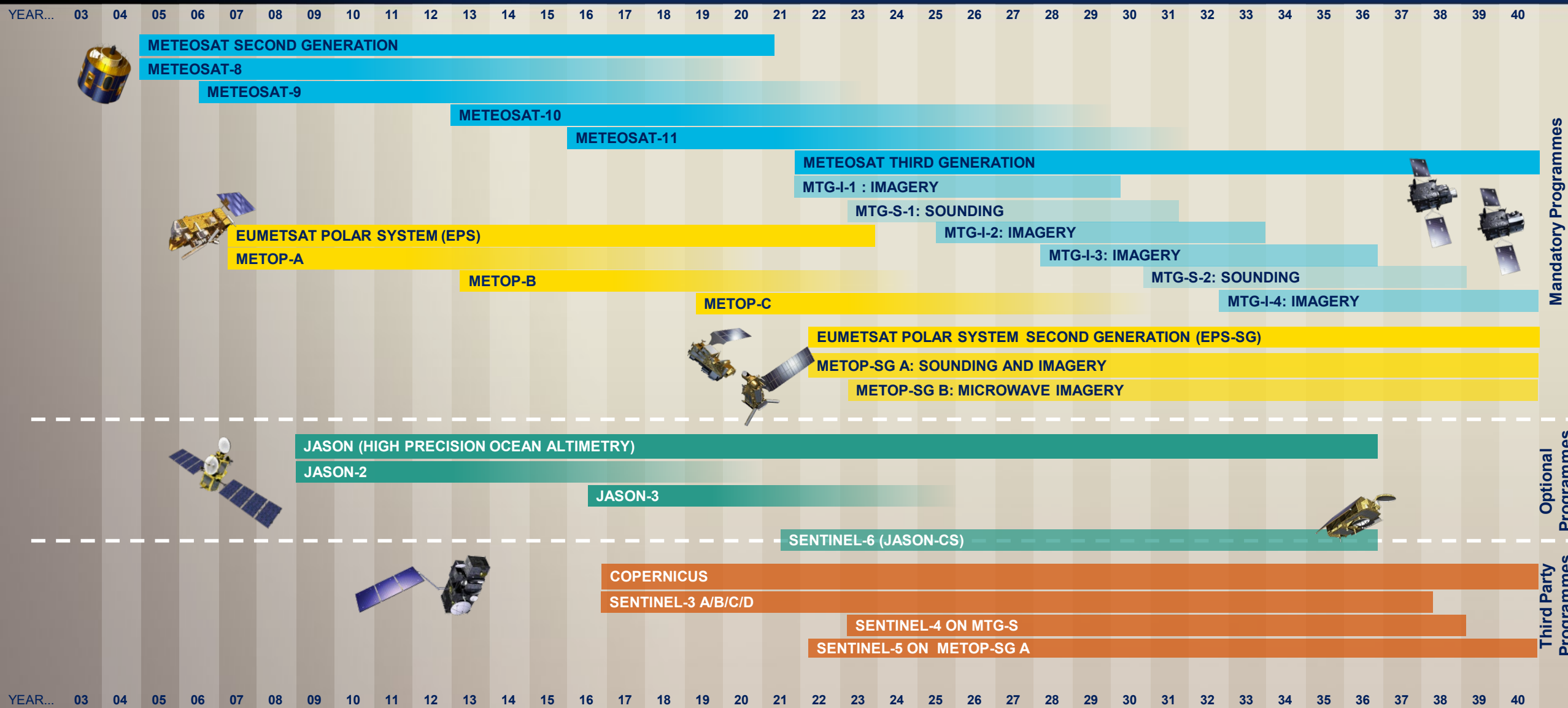




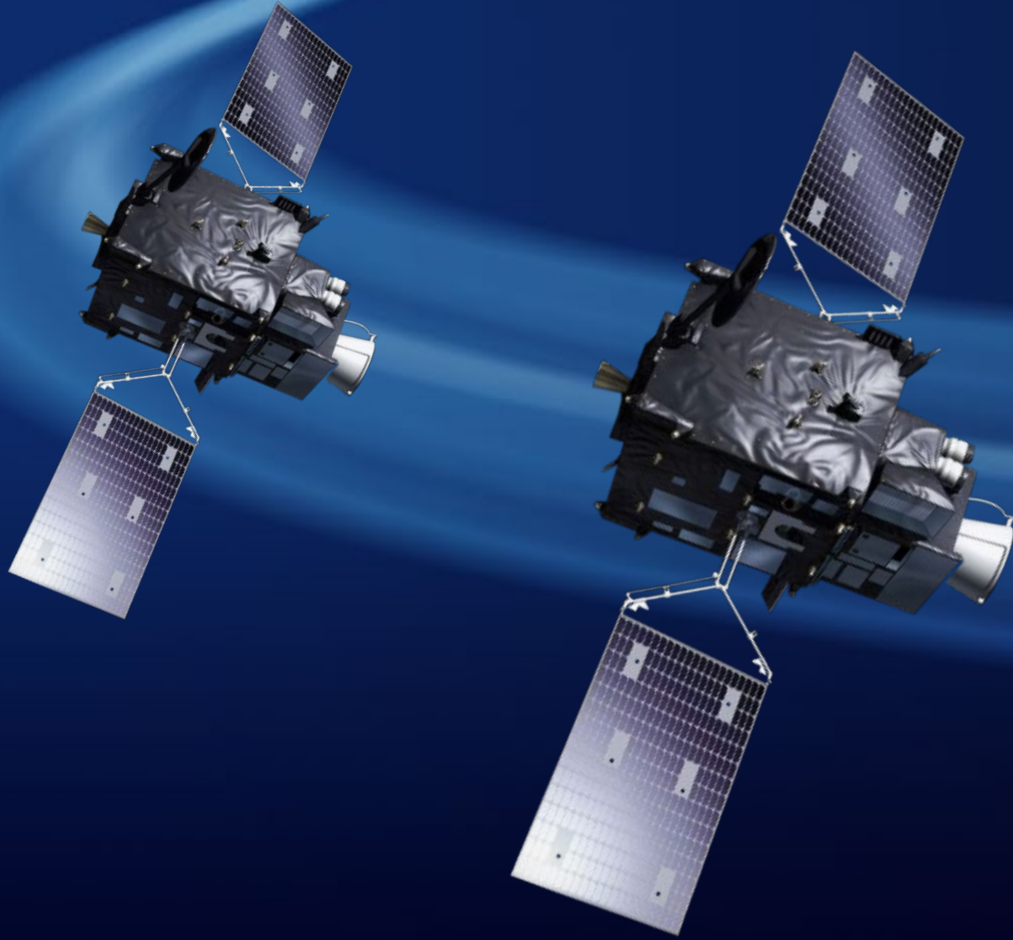
# Meteosat Third Generation (MTG): Benefits and current status



# EUMETSAT Mission Planning



# MTG-I imaging mission



- Imagery mission implemented by two MTG-I satellites
- Full disc imagery every 10 minutes in 16 bands
- Fast imagery of Europe every 2.5 minutes
- New Lightning Imager (LI)
- Start of operations in 2022
- Operational exploitation: 2022-2042

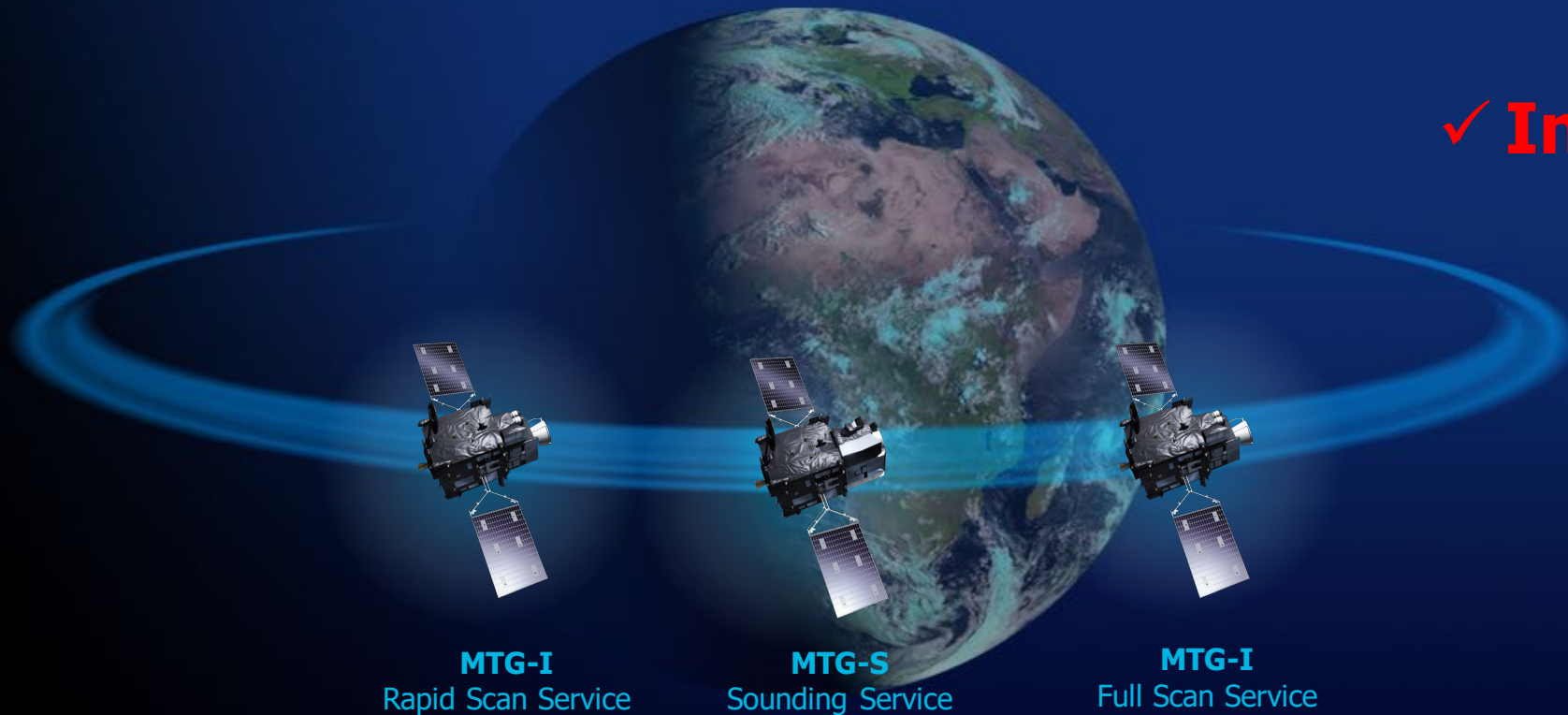
# MTG-S sounding mission



- Hyperspectral infrared sounding mission
- 3D weather cube: temperature, water vapour, O<sub>3</sub>, every 30 minutes over Europe
- Air quality monitoring and atmospheric chemistry in synergy with Copernicus Sentinel-4 instrument
- Start of operations in 2024
- Operational exploitation: 2024-2043



# MTG full operational configuration



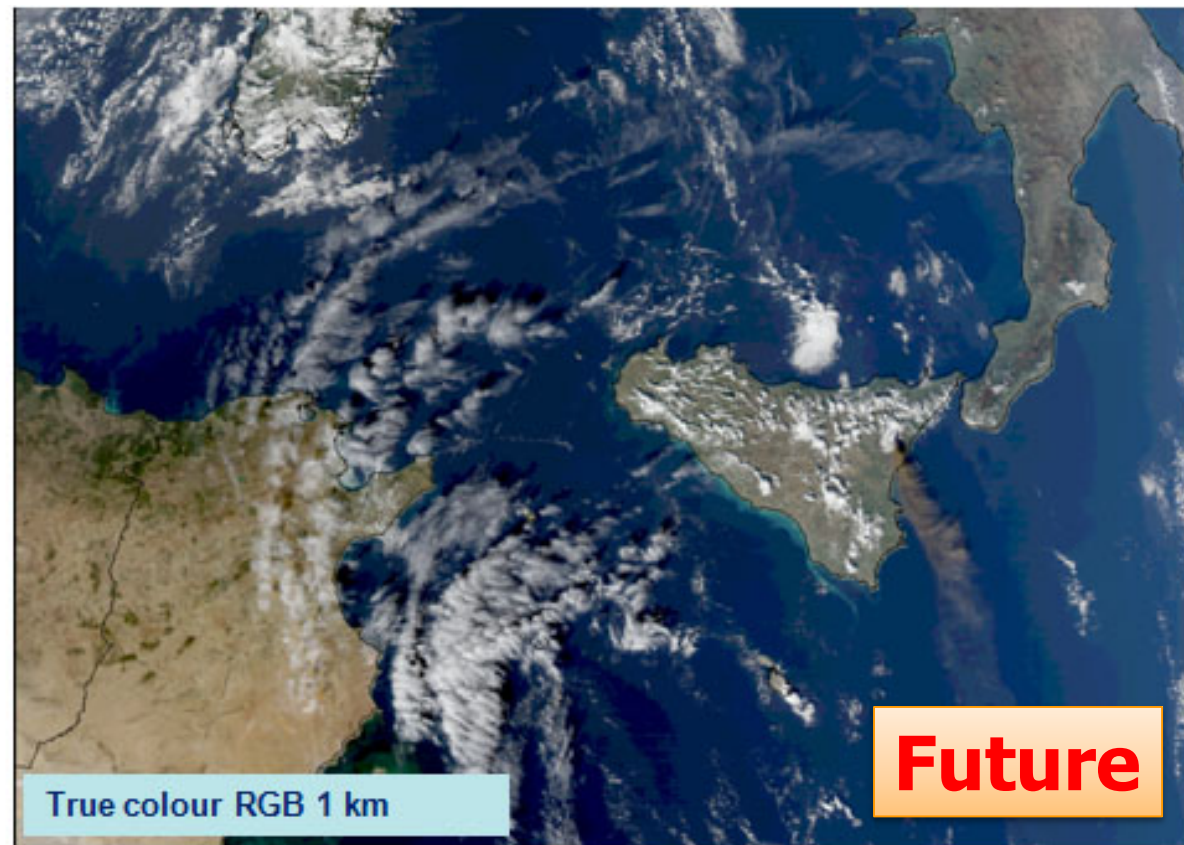
✓ **Continuity**

✓ **Innovation**

# Application scenarios for MTG data

- Monitoring and nowcasting severe convective storms
- Detecting convective initiation, a precursor of potentially severe storms
- Fog detection for transport safety
- Lightning monitoring for storm tracking over oceans
- Air quality monitoring
- Fire detection and monitoring
- Enhancing numerical weather prediction

# MTG Imager (FCI): higher spatial resolution imagery

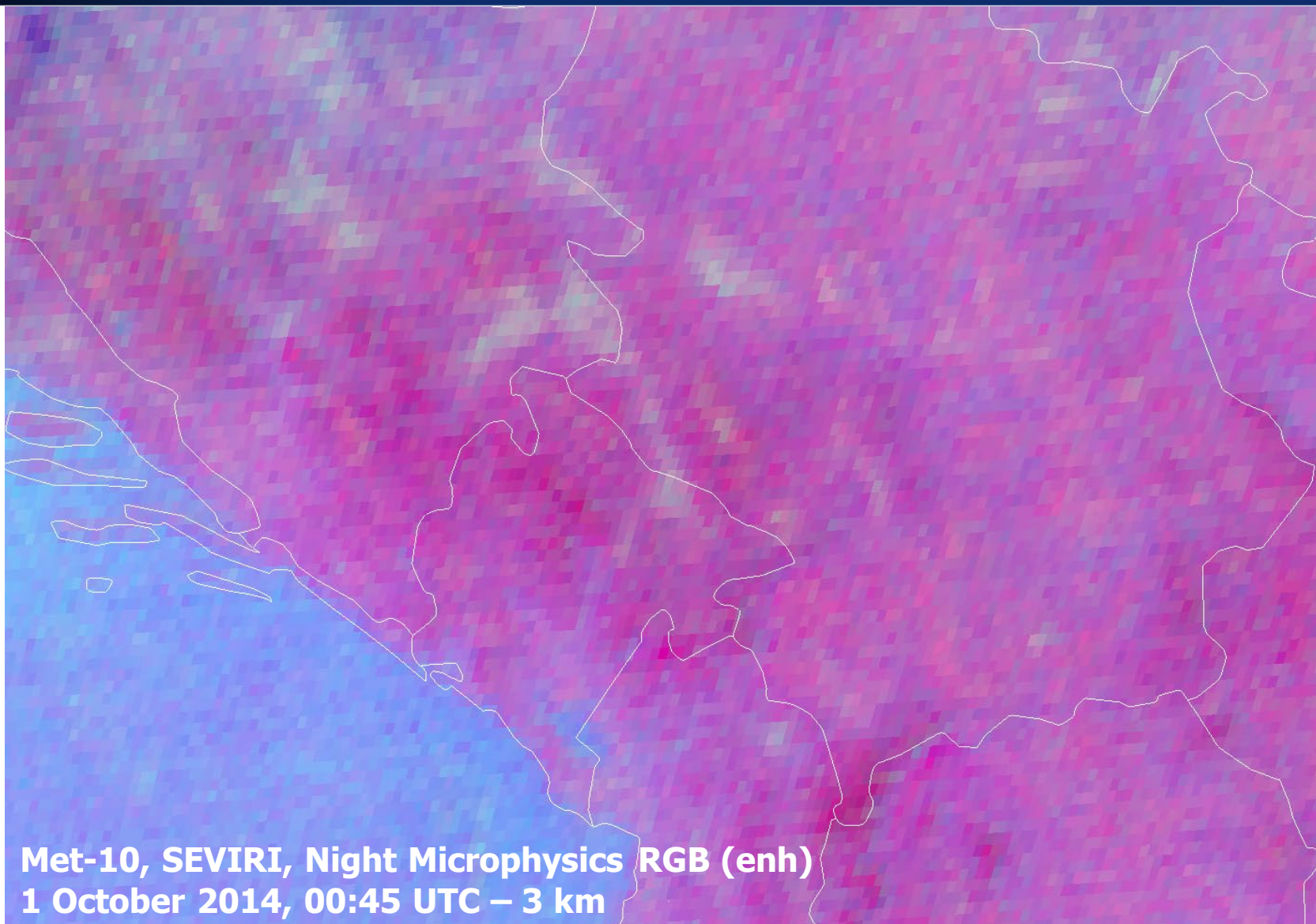


Example of ash detection, SEVIRI Natural Colour RGB, 12:15 UTC, 26 November 2006 (left), MODIS True Colour RGB, 12:20 UTC, 26 November 2006



# MTG Imager (FCI): higher spatial resolution imagery

Fog detection over  
Western Balkans

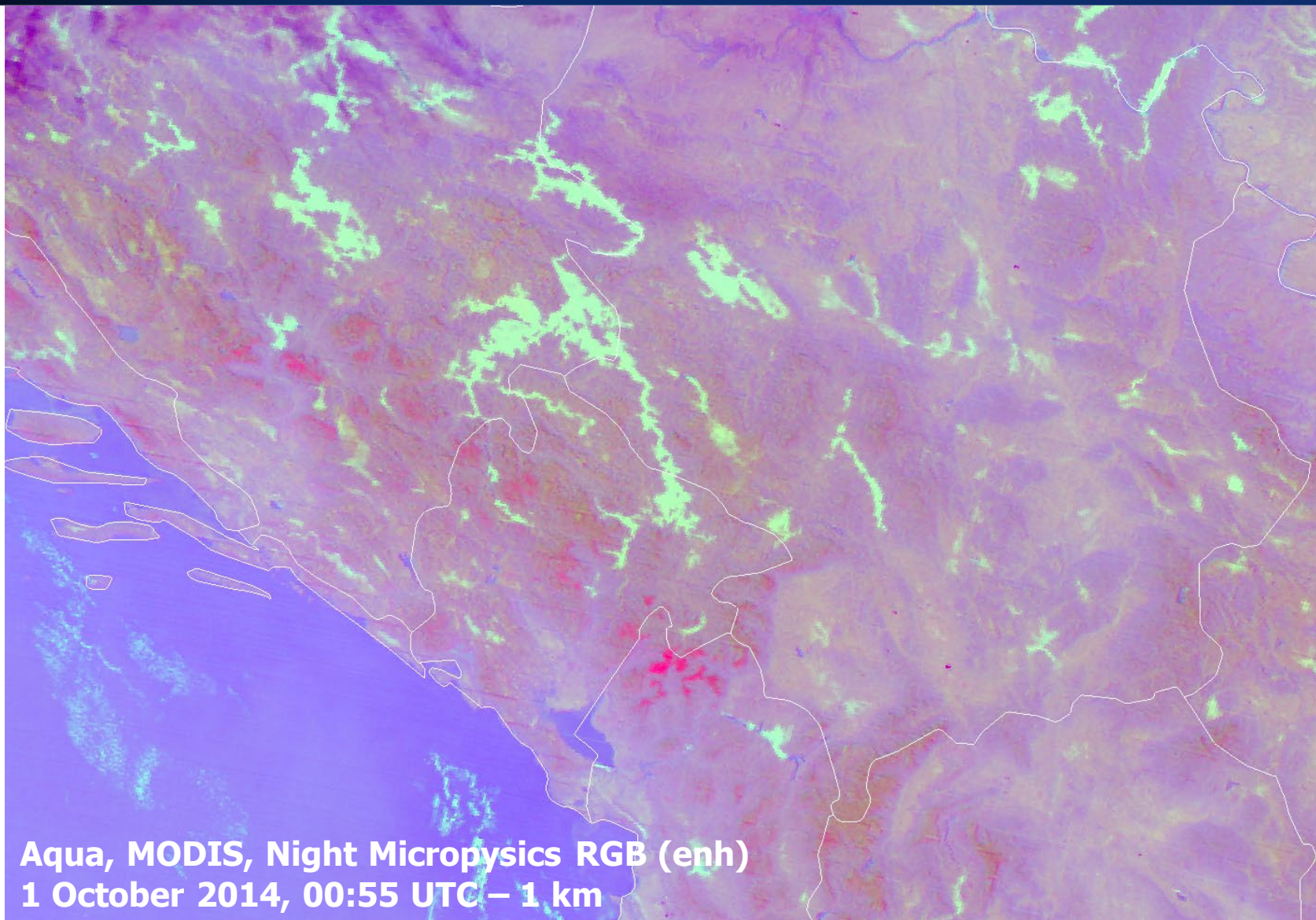


Current



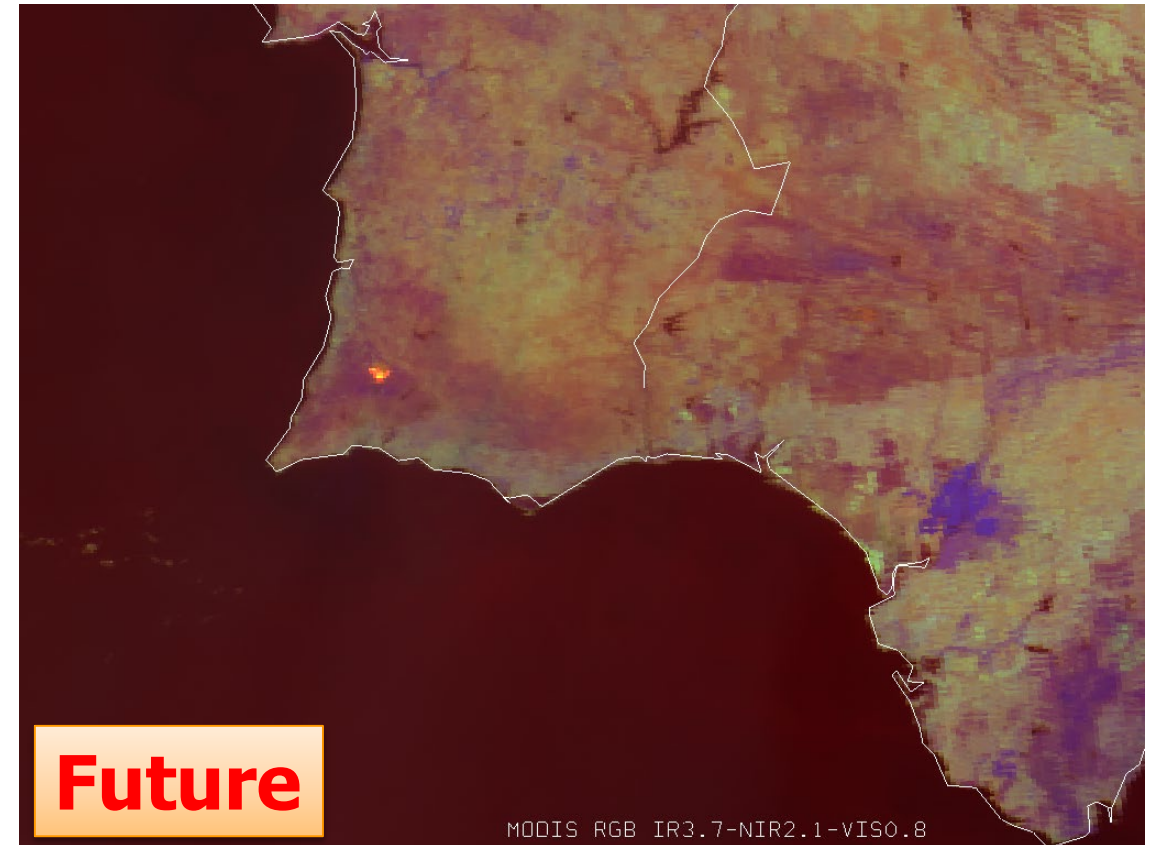
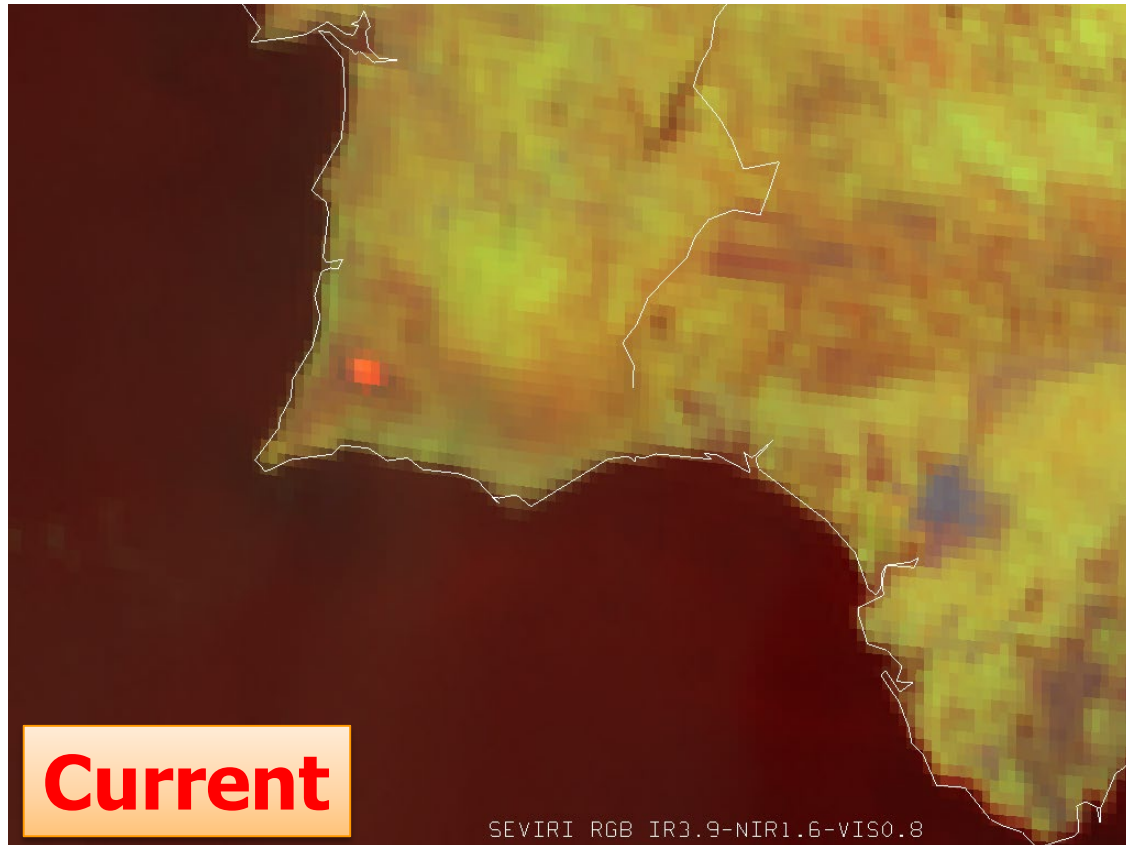
# MTG Imager (FCI): higher spatial resolution imagery

Fog detection over  
Western Balkans



**Future**

# MTG Imager (FCI): New prospects for fire detection and monitoring

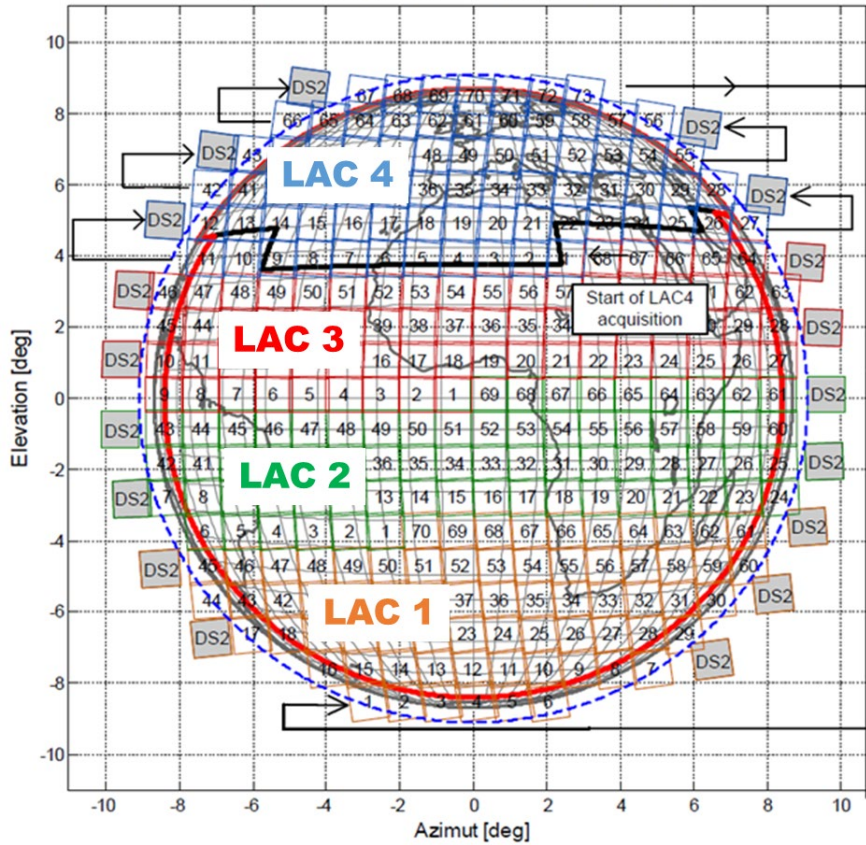


Portugal, Algarve, 5 Aug 2018

**Higher spatial and temporal resolution; new channel for improved fire detection at 2.2  $\mu\text{m}$**



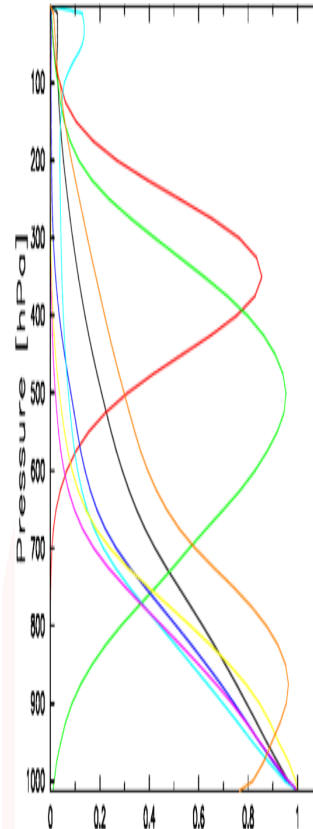
# MTG Infra-Red Sounder (IRS)



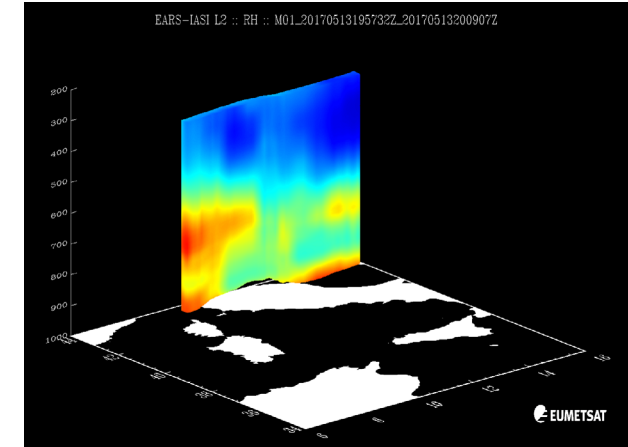
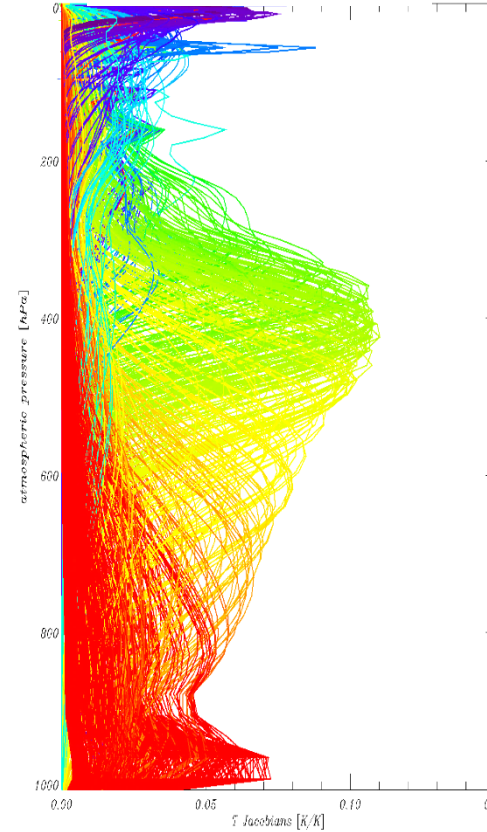
## 4 Local Area Coverage (LAC):

- One LAC acquired within 15'
- Overlapping step & stare dwells
- 160x160 pixels, ~4km at Nadir
- Europe (LAC 4) observed every 30'

MSG Radiometer



Hyperspectral sounder (IASI)



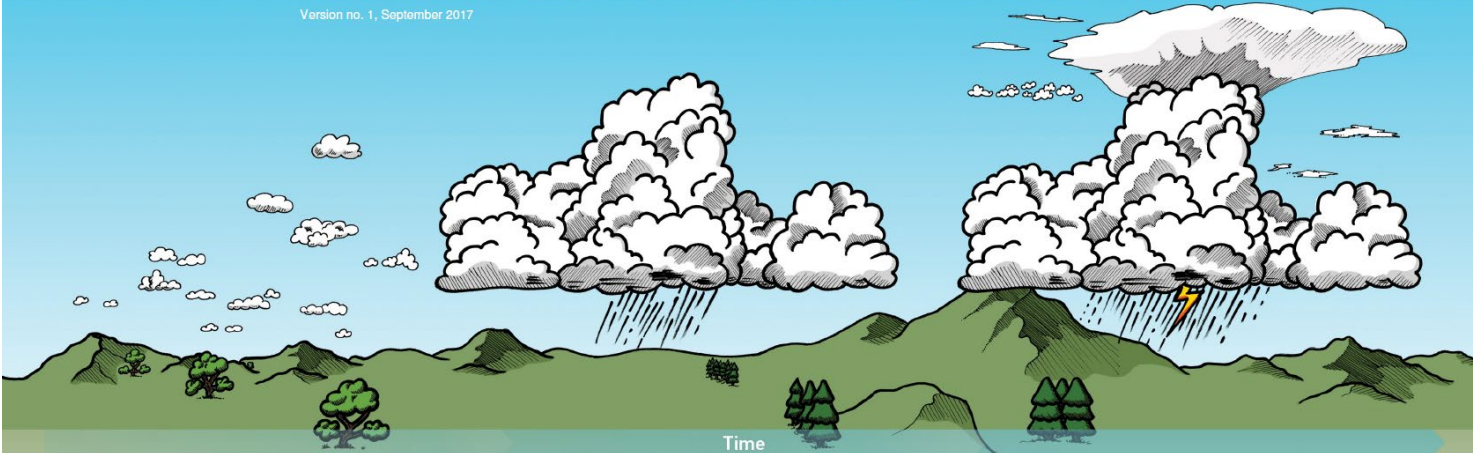
**Major innovation:**  
Operational spectro-imagery at high spectral, spatial & temporal resolution



# MTG Imager and Sounder: Tools for Nowcasting

## STEP BY STEP DEEP CONVECTION NOWCASTING

Version no. 1, September 2017



Time

### 1. Pre-Convective Environment

Refers to the 4-D thermodynamic and wind field present before convective initiation occurs.

#### Useful tools:

NWP data, Radiosonde and aircraft measurements  
 MSG GI/R11 Product – instability & moisture  
 iSHAI Products – instability & moisture  
 HRW Product – wind fields  
 METOP/IASI level2 – temp & moisture vert. profiles



**ARSO METEO**  
Slovenian Environment Agency

Cloud photos source: WMO International Cloud Atlas, Copyright Stephen Burt and Matthew Clark

### 2. Convective Initiation

Refers to the process where an existing cumulus cloud begins rapid vertical growth.

#### Useful tools:

Radar, lightning data  
 Cloud Type  
 Cloud Top Temperature  
 Cloud Microphysics  
 Convection Initiation – demonstrational  
 Optimal Cloud Analysis



**EUMETSAT**  
**NWCSAF**

### 3. Mature Convective Storm

Refers to the presence of convective clouds with tops at or above their local equilibrium level.

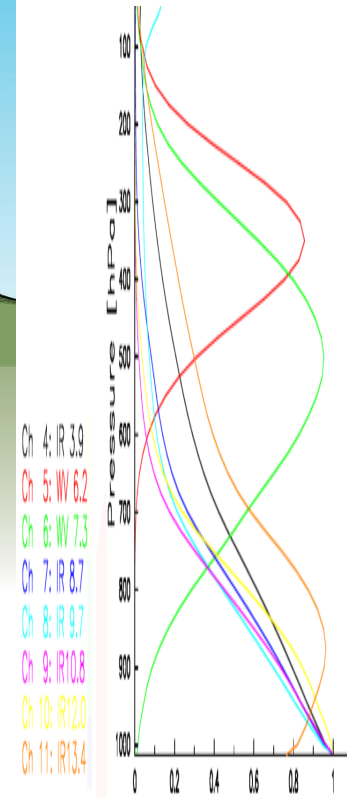
#### Useful tools:

Radar, lightning data  
 RDT Product – storm tracking  
 Precipitating Clouds  
 CRR Product – precipitation  
 NEFODINA  
 Convection RGB  
 Overshooting Top Detection  
 MSG Sandwich Product (HRV+IR10.8 enhanced)

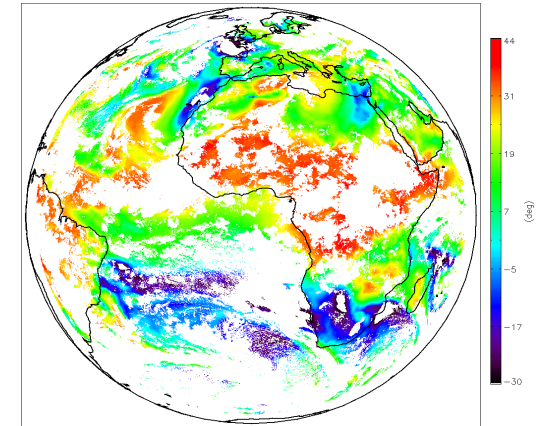
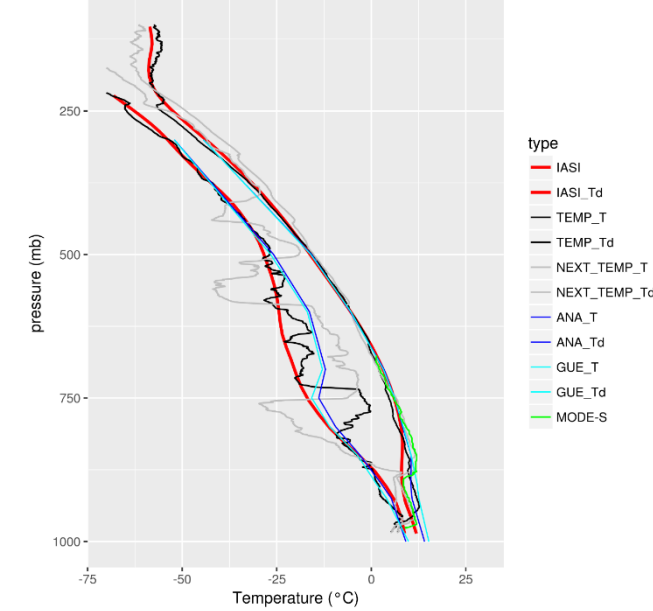


**EUMETSAT**

## MSG Radiometer



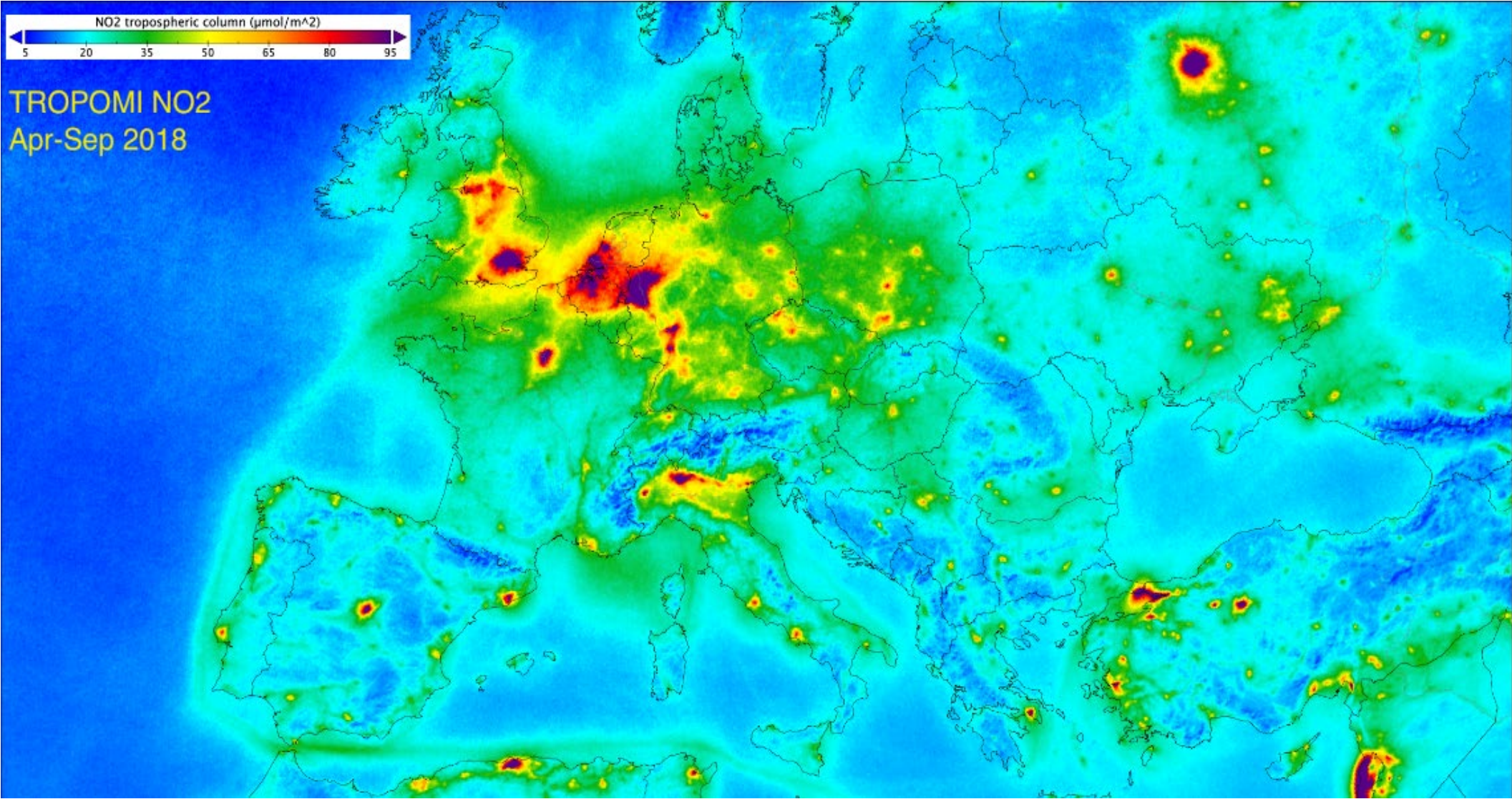
T and Td profiles Ljubljana 20.10.2017 17:32 UTC Metop A



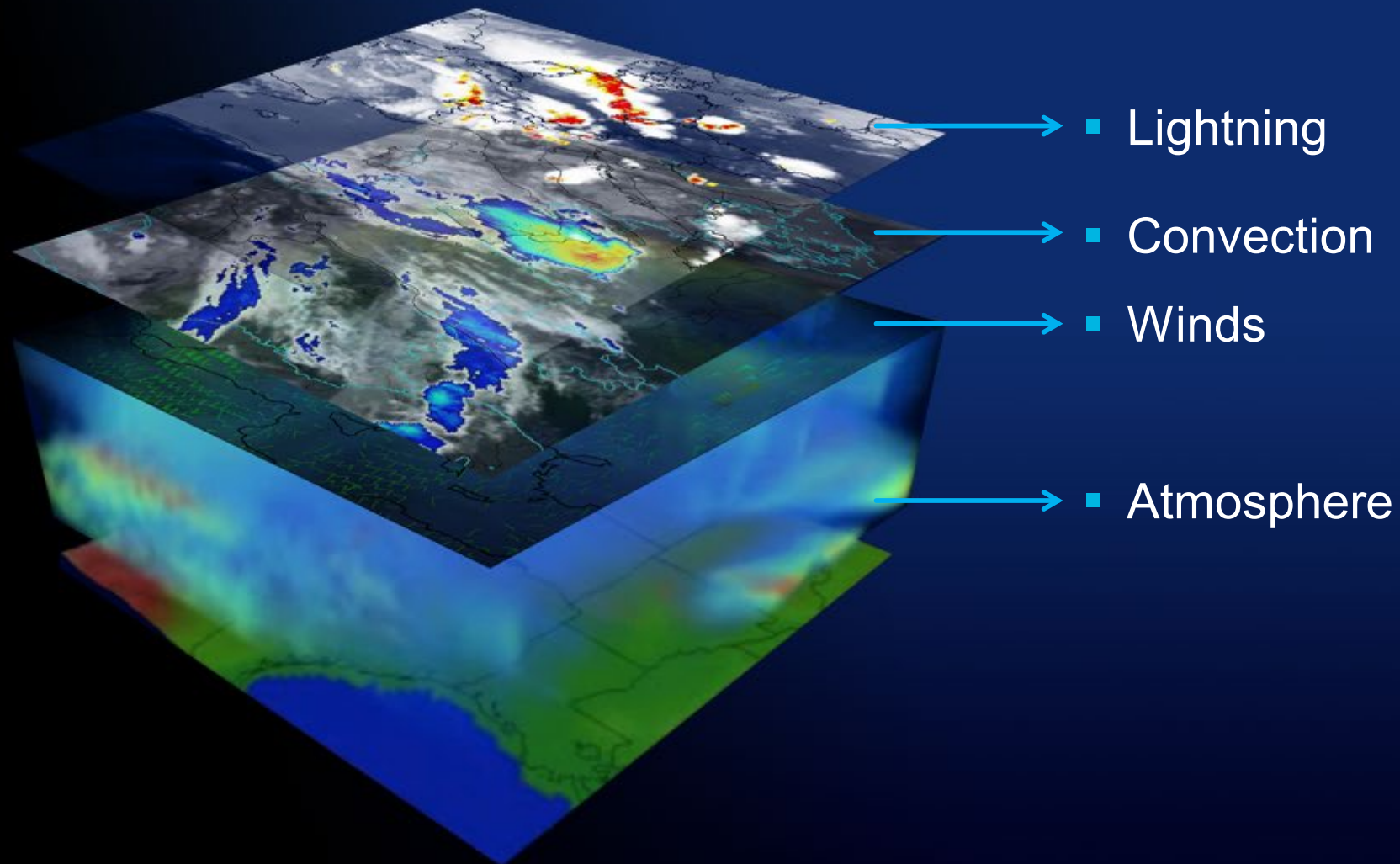
MSG Global Instability Index



# MTG-S: Monitoring air pollution

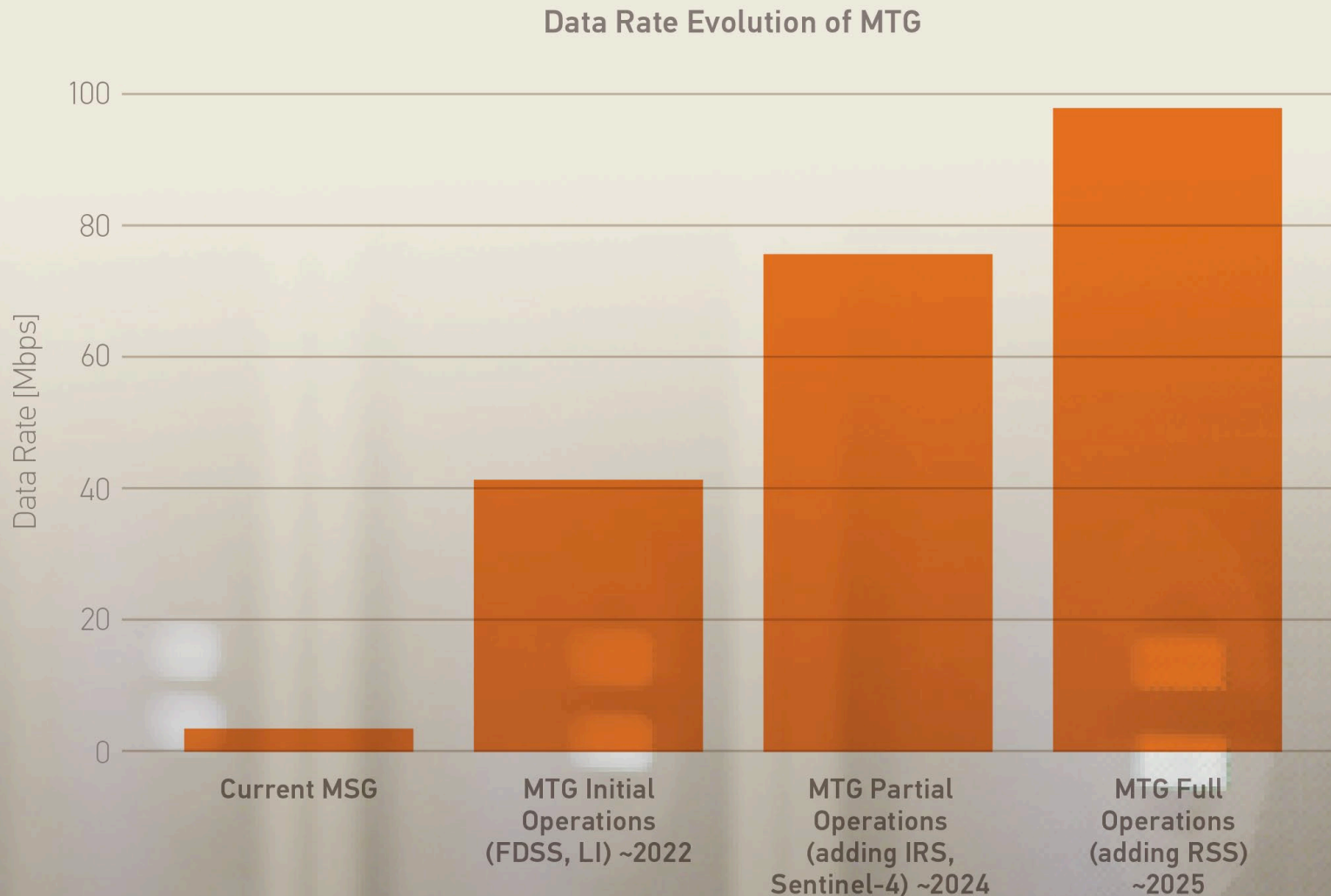


# 4D weather cube with MTG-I and MTG-S





# MTG: Data Access and Processing



Evolution of data rates from current MSG to the full MTG operations.

# Transitioning from MSG to MTG

## PLANNED SATELLITE PAYLOADS WITHIN THE MTG PROGRAMME

Satellite	Instrument payload
<b>MTG-I1</b>	Imaging (FCI, LI)
<b>MTG-S1</b>	Sounding (IRS, UVN)
<b>MTG-I2</b>	Imaging (FCI, LI)
<b>MTG-I3</b>	Imaging (FCI, LI)
<b>MTG-S2</b>	Sounding (IRS, UVN)
<b>MTG-I4</b>	Imaging (FCI, LI)

## TRANSITION SCHEDULE

(Status: April 2019)

Year	Launch & Commissioning	0° services	Rapid Scanning Service
2021	<b>MTG-I1</b>	Meteosat-11 (parallel) MTG-I1	Meteosat-10
2022		Meteosat-11 (parallel) MTG-I1	Meteosat-10
2023	<b>MTG-S1</b>	Meteosat-10 (parallel) MTG-I1 MTG-S1	Meteosat-11
2024		MTG-I1 MTG-S1 Meteosat-10 (parallel)	Meteosat-11
2025	<b>MTG-I2</b>	MTG-I2 MTG-S1	MTG-I1 Meteosat-11 (parallel)
2026		MTG-I2 MTG-S1	MTG-I1

# Summary

- MTG will become operationally available between 2022 and 2025
- An MSG capability is likely to be available throughout the 2020s
- EUMETCast Europe will remain the key dissemination system for safety critical MTG data
- Preparation is necessary at NMHs level to take early advantage of the mission in service delivery
- Next opportunities for SEE: biennial EUMETSAT information days in the region . The next ones planned in 2021.



# EUMETSAT Information Days

- Information Day for Western Balkan
  - Held in Skopje, North Macedonia, 13-14 March 2019
  - ICSEED Participants: Albania, Bosnia&Herzegovina, Montenegro, North Macedonia, Serbia (invited but not present)
- Information Day for Eastern Europe, Caucasus and Central Asia
  - Held in Nur-Sultan, Kazakhstan, 10-11 April 2019
  - ICSEED Participants: Moldova, Ukraine, Turkey
- Main outcomes:
  - Data access: replacement of the DAWBEE EUMETCast data reception station
  - Training: Continuation of the SEEMET training course + possibility to participate to other EUMETSAT training events
  - Discussion on the transition to MTG and on the extended use of SAF products (in support to various applications)
  - Possibility to include satellite meteorology on regional project (e.g. EU or WB funded)

# Information on Meteosat Third Generation (MTG)

- [www.eumetsat.int](http://www.eumetsat.int) : Satellites : Future Satellites
- MTG User Preparation Project (MTGUP)
- Questions: User Helpdesk  
[ops@eumetsat.int](mailto:ops@eumetsat.int)

# Thank you

- Add Brochure covers



# BACKUP