

# EUMETSAT Space Agency Report

*Dorothee Coppens*



# Outline

- ✓ **EUMETSAT missions overview**
- ✓ **Future Polar orbit Mission**
- ✓ **Future Geostationary mission**
- ✓ **Metop-A End Of Life – Announcement on a specific campaign for IASI**

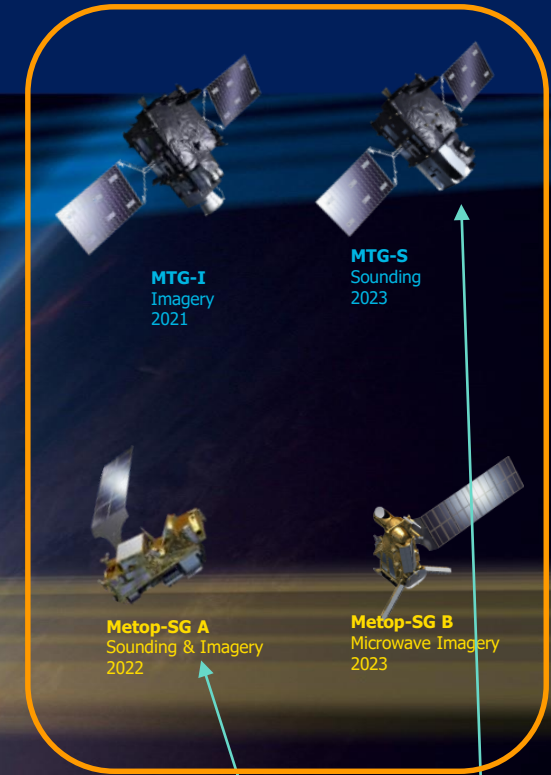
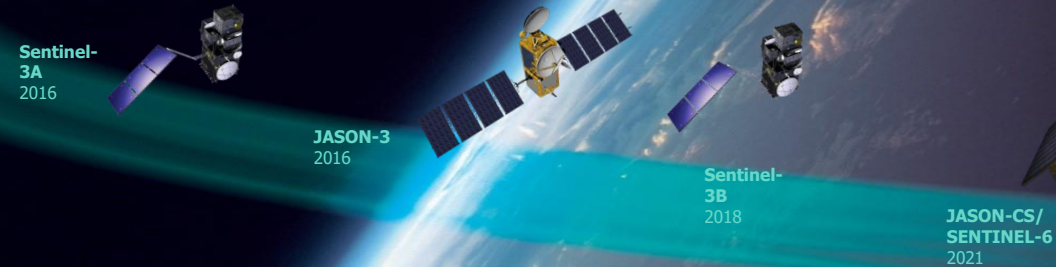
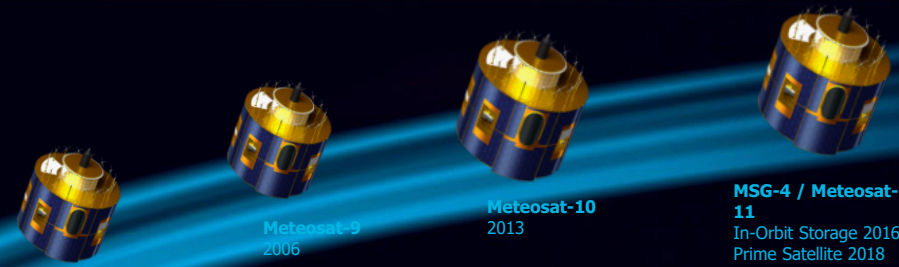
# EUMETSAT missions – current and future

## Geostationary Programmes

## Mandatory Programmes

## Polar Programmes

## Optional and Third Party Programmes (incl. Copernicus)



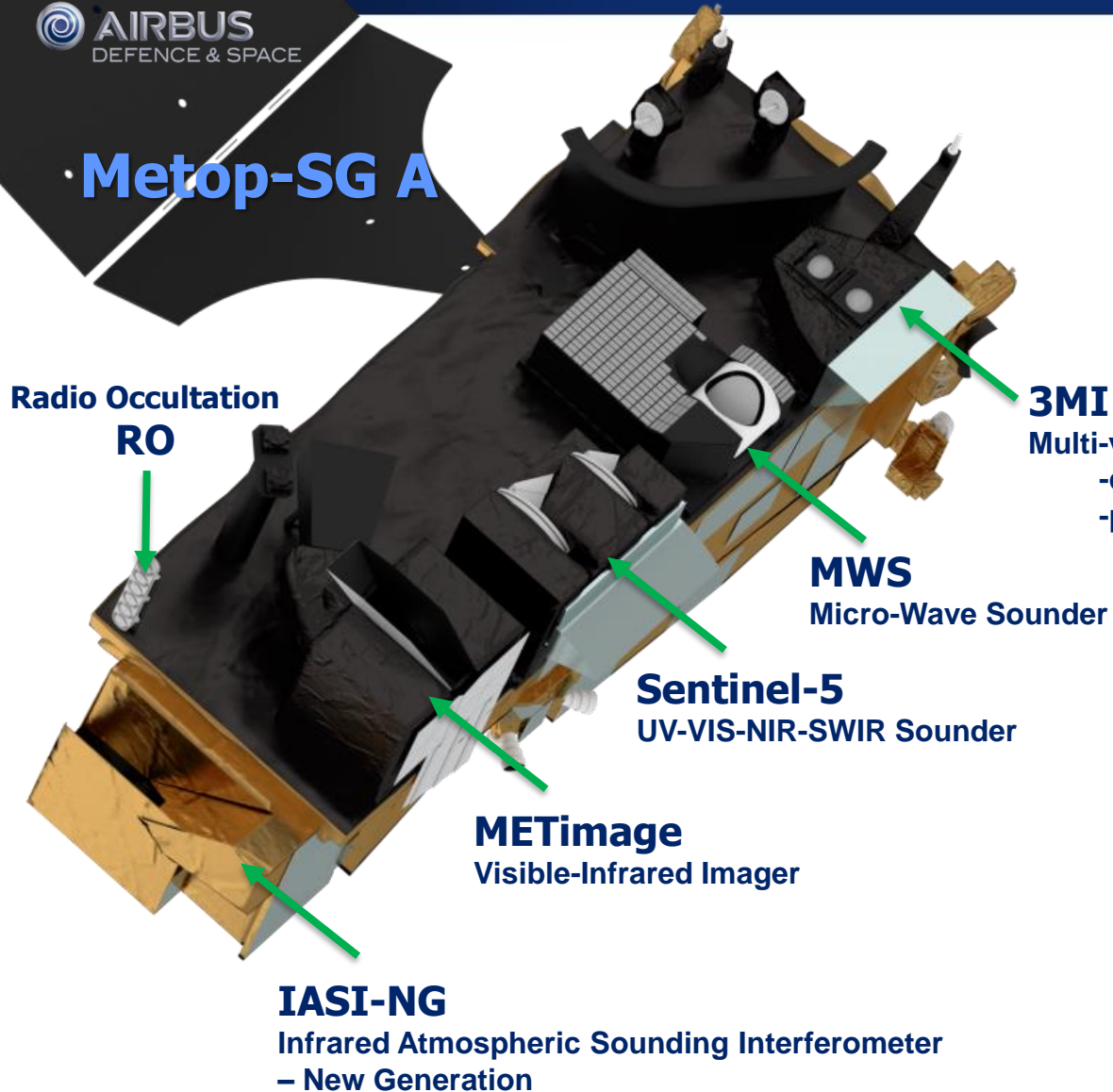
# Future Polar orbit mission



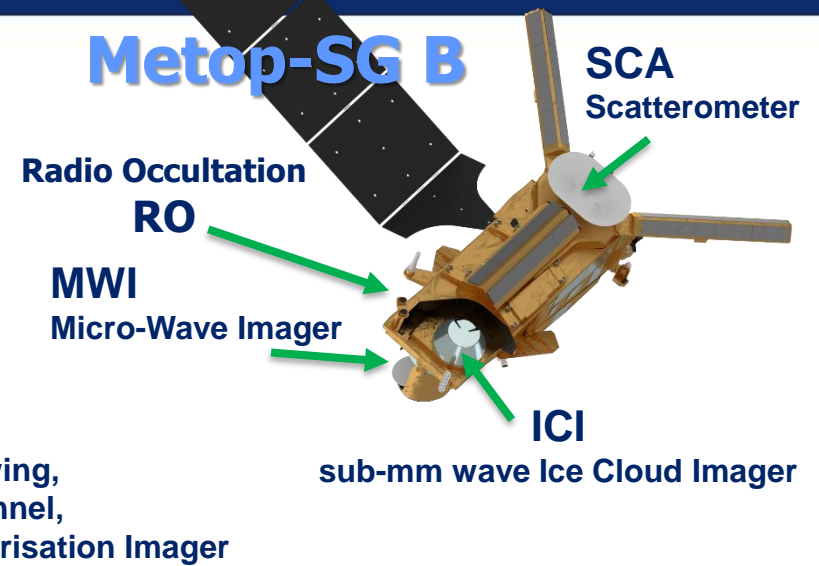
# EPS-SG: Metop-SG satellites



## Metop-SG A



## Metop-SG B



Two-satellite configuration Metop-SG-A and –B on the same orbit, separated by 90°

Metop-like orbit:

- Sun synchronous
- low earth orbit at 835 km mean altitude
- 09:30 local time of the descending node

First launches:

- Metop-SG A1 → Early 2024
- Metop-SG B1 → Early 2025

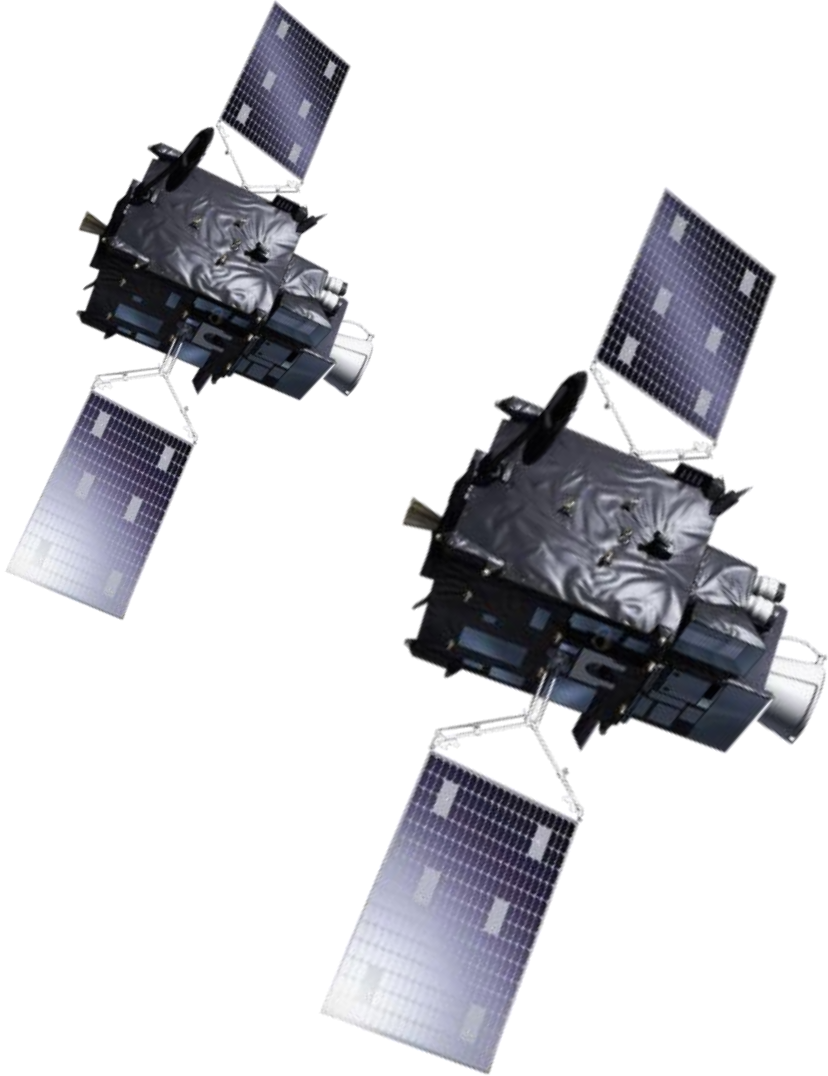
# EPS-SG benefits to activities of NMSs

| Main Payload  | Enhanced Capabilities  | Innovative Capabilities  | Applications Benefiting                                      |
|---|--|--|--|
| High-Resolution Infrared Sounding ( <b>IASI-NG</b> )          | Higher spectral resolution (Twice better than IASI) + Better radiometric noise (half IASI) | More trace gases and their vertical profiles                     | NWP, NWC, AC, CM, Oceanography                               |
| Microwave Sounding ( <b>MWS</b> )                             | Enhanced spatial over-sampling   | Ice-cloud info in support of water-vapour profiling              | NWP, NWC, CM, Hydrology                                      |
| Radio Occultation Sounding ( <b>RO</b> )                      | Large increase of number of radio-occultations   | Tracking of Galileo, Beidou and QZSS signals                     | NWP, CM  |
| Nadir viewing UV/VIS/NIR/SWIR Sounding ( <b>Sentinel-5</b> )  | Drastic increase of spatial resolution   | Additional trace gas measurements; CO <sub>2</sub> being studied | Air Quality, CM, AC  |
| VIS/IR Imaging ( <b>METimage</b> )                            | Better radiometric and spatial resolution  | Far more variables measured with higher accuracy                 | NWC, NWP, CM, Land-surface analysis, Oceanography, Hydrology |
| Scatterometry ( <b>SCA</b> )                                  | Higher spatial resolution and coverage   | Cross polarisation for higher wind speeds                        | NWP, NWC, CM, Hydrology, Oceanography                        |
| Multi-viewing, -channel, -polarisation Imaging ( <b>3MI</b> ) | New mission  | Aerosol parameters   | Air quality, CM, NWC, Land surface analysis                  |
| Microwave Imaging ( <b>MWI</b> )                              | New mission  | Precipitation observations                                       | NWP, NWC, Hydrology, CM, Oceanography                        |
| Ice Cloud Imaging ( <b>ICI</b> )                              | New mission  | Cloud microphysics parameters                                    | NWP, NWC, Hydrology, CM                                      |

NWP: Numerical Weather Prediction; NWC: Nowcasting; CM: Climate Monitoring; AC: Atm. Composition

# Future Geostationary mission

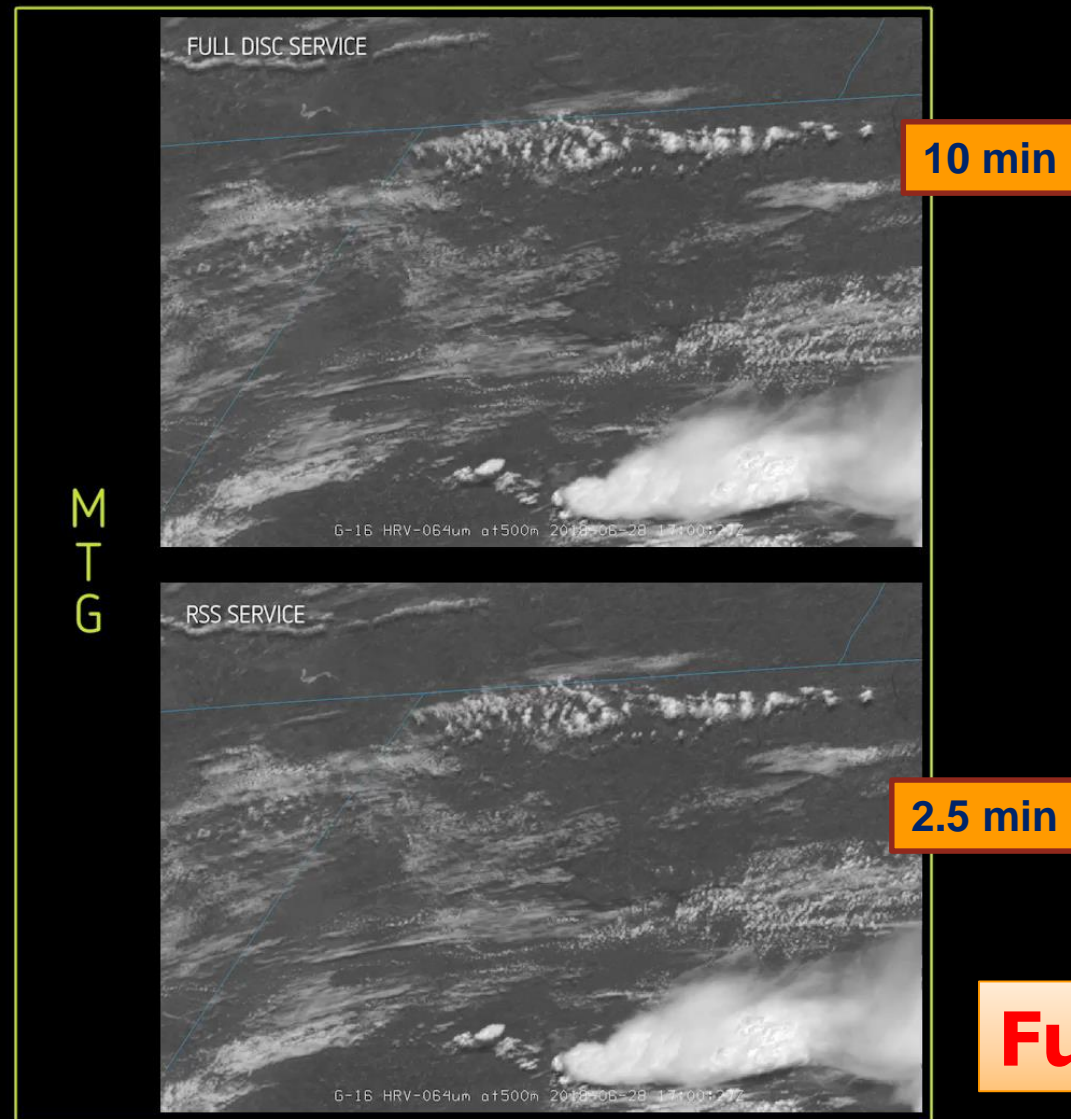
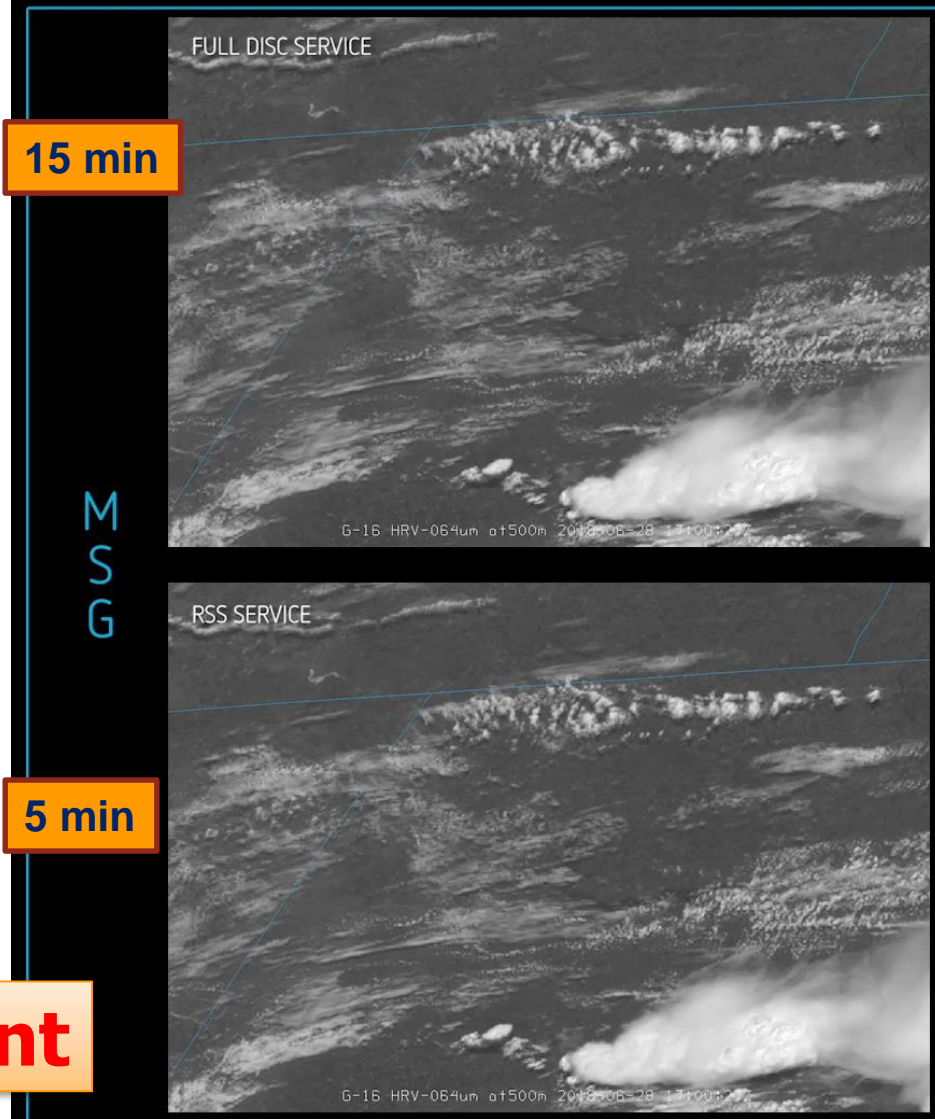
# MTG-I imaging mission



- Imagery mission implemented by two MTG-I satellites
- Full disc imagery every 10 minutes in 16 bands with the Flexible Combined Imager (FCI)
- Fast imagery of Europe every 2.5 minutes
- New Lightning Imager (LI)
- First launches:
  - MTG-I1 → Late 2022
  - MTG-I2 → 2025
- Start of operations in 2023
- Operational exploitation: ~2023-2043



# MTG Imager (FCI): New insights through higher temporal resolution



**Current**

**Future**

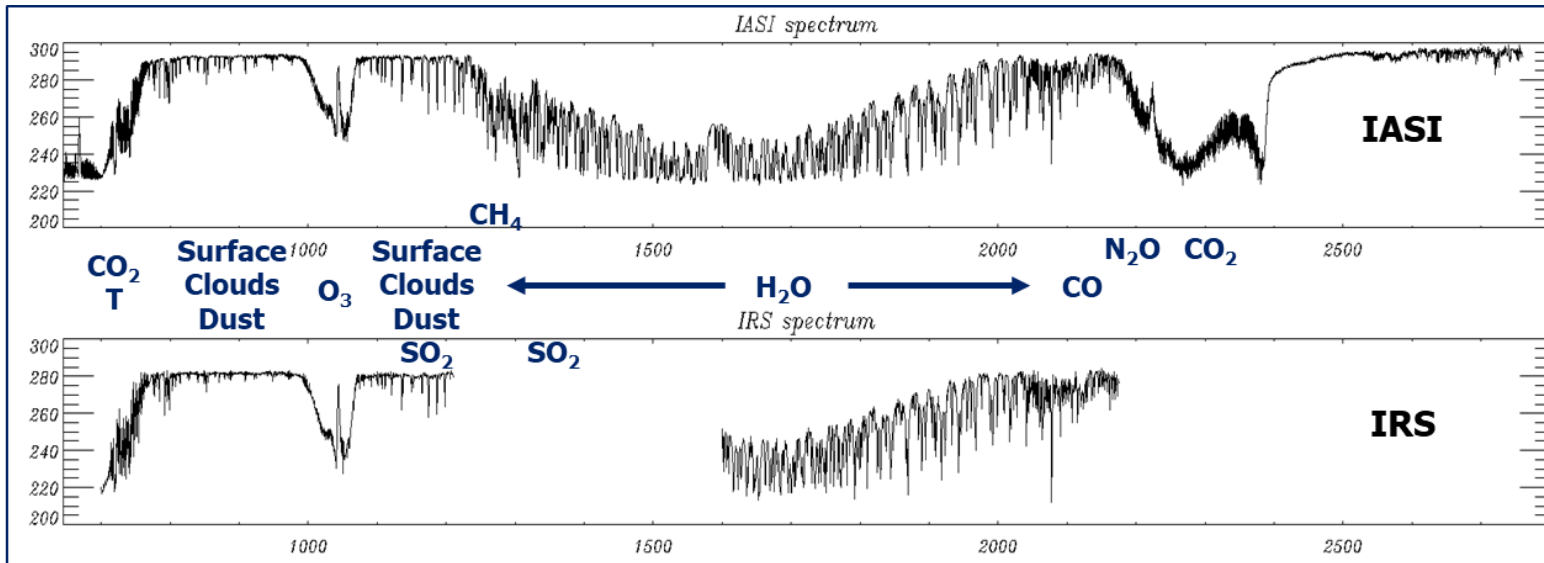
# MTG-S sounding mission



- 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
- First launches:
  - MTG-S1 → Early 2024
- Start of operations in late 2024/early 2025
- Operational exploitation:  
~2024-2044

# MTG Infra-Red Sounder (IRS)

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

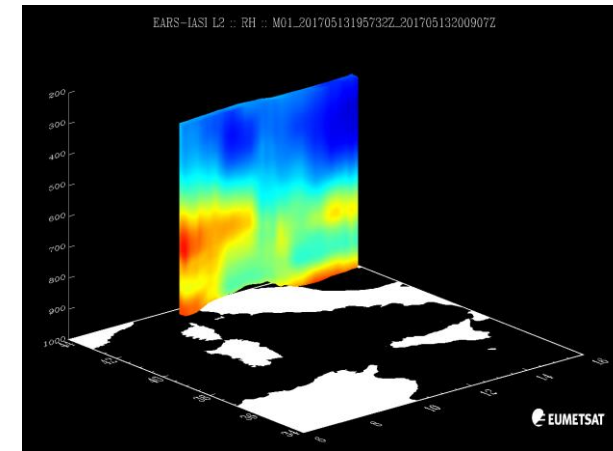


Two spectral bands:

- ✓ LWIR: 680 to 1210 cm<sup>-1</sup> (8.26–14.70 μm)
- ✓ MWIR: 1600 to 2250 cm<sup>-1</sup> (4.44–6.25 μm)

Spectral sampling: ~0.6 cm<sup>-1</sup>

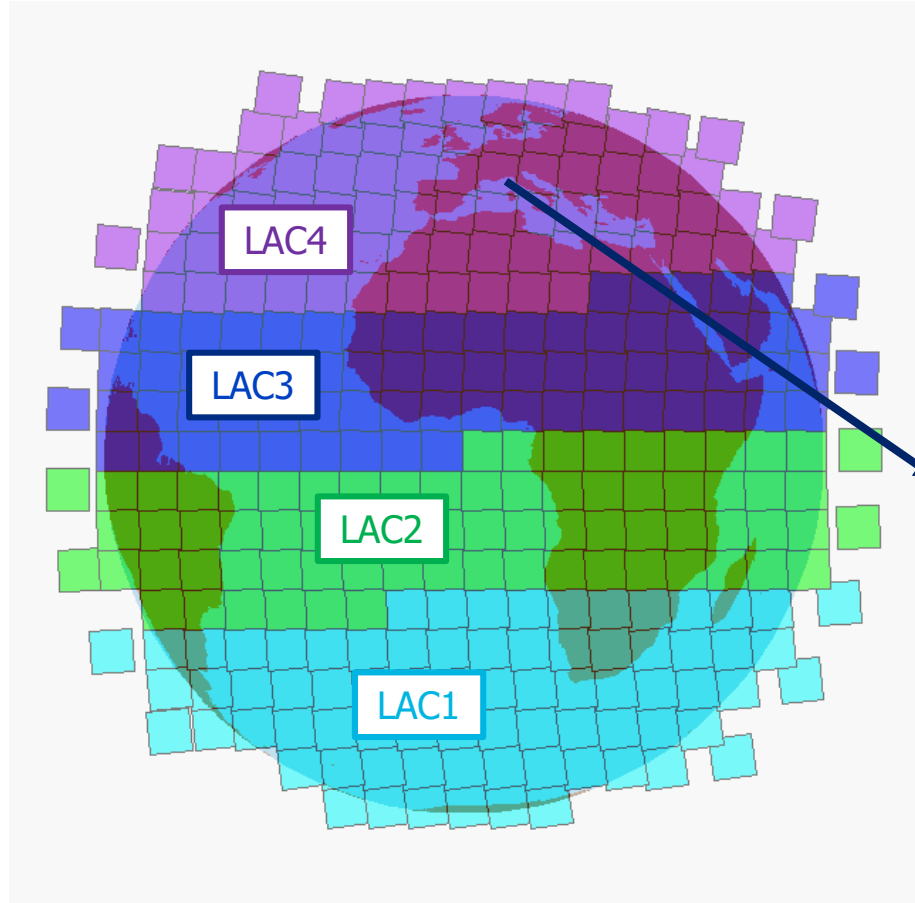
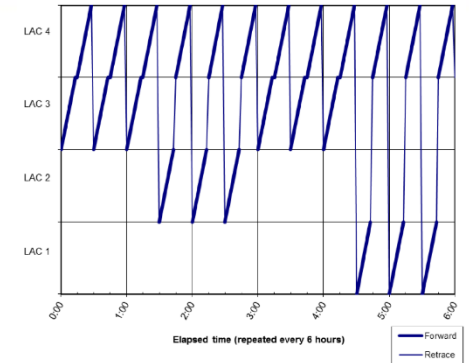
Spatial resolution :4 km at nadir spatial



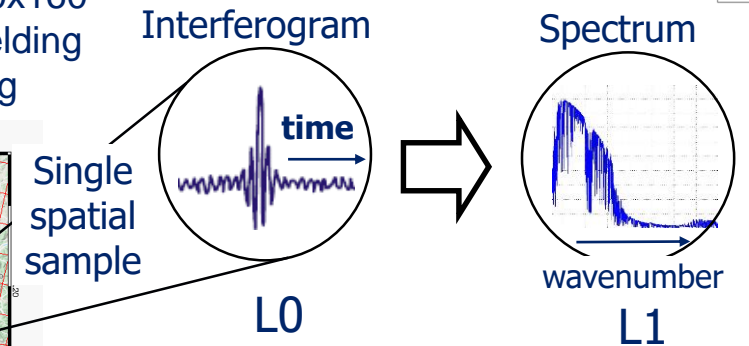
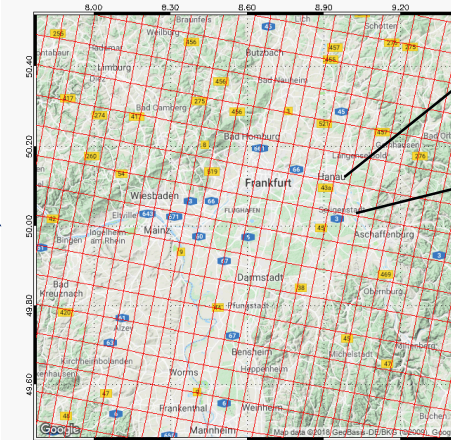
For Nowcasting and NWP

# MTG Infra-Red Sounder (IRS) scanning sequence

- ✓ 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



Each dwell consists of 160x160 pixels (4km resolution) yielding a high spatial sampling



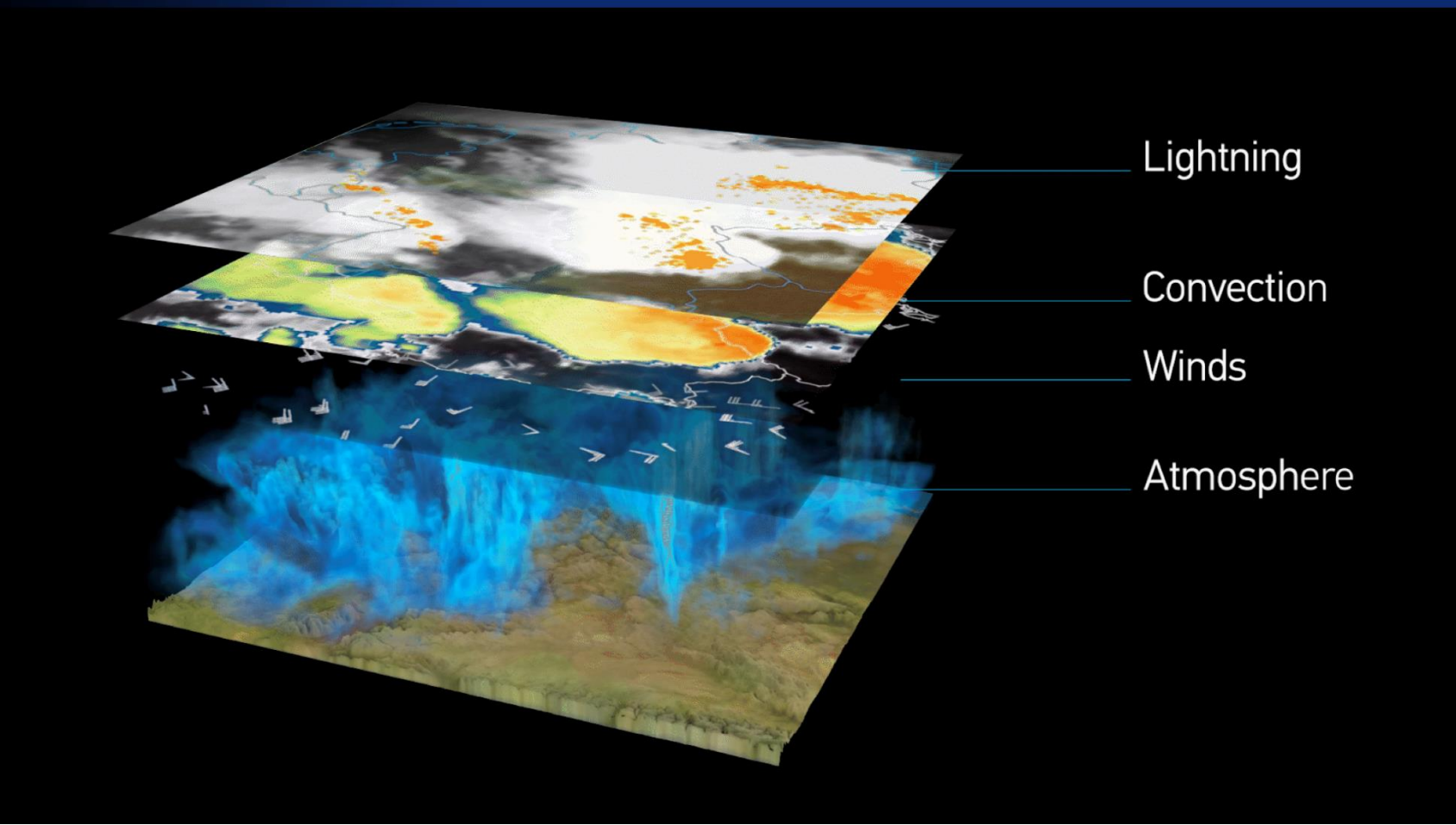
➔ **25600 spectra every 10 s**

**Dissemination of the PCs**

- ✓ There are 12 LAC1, 12 LAC2, 24 LAC3 and 48 LAC4 per day
- ✓ Size of a LAC is ~ 1.1Go



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

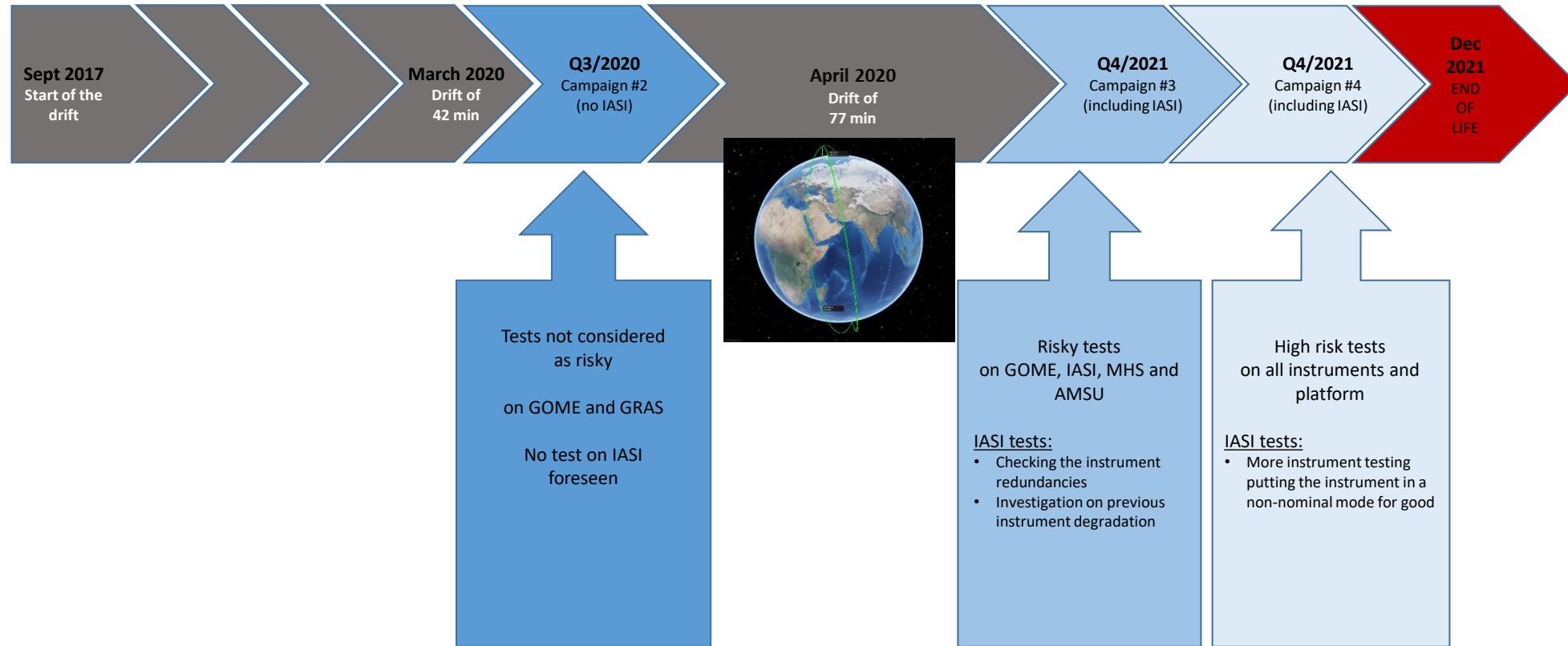




# Metop-A End Of Life

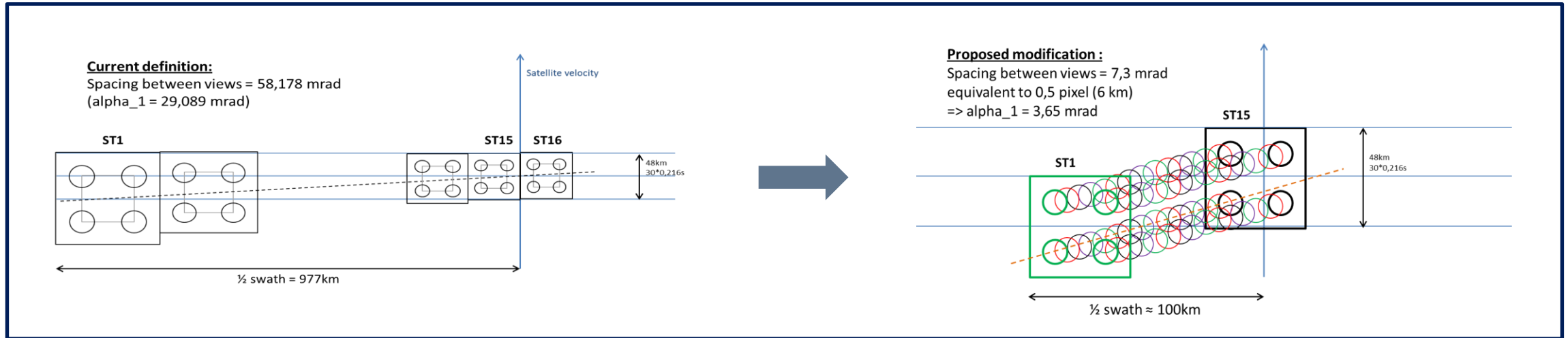
# Metop-A EOL activities – link to IASI

## Metop-A End Of Life activities



# Most interesting IASI EOL test for the users

- ✓ **Reduction of swath and increase of spatial sampling by modification of scan alpha law**



- ✓ **This EOL test will happen end of September 2021 for a full repeat cycle of 29 days**

**Thanks for your attention!**