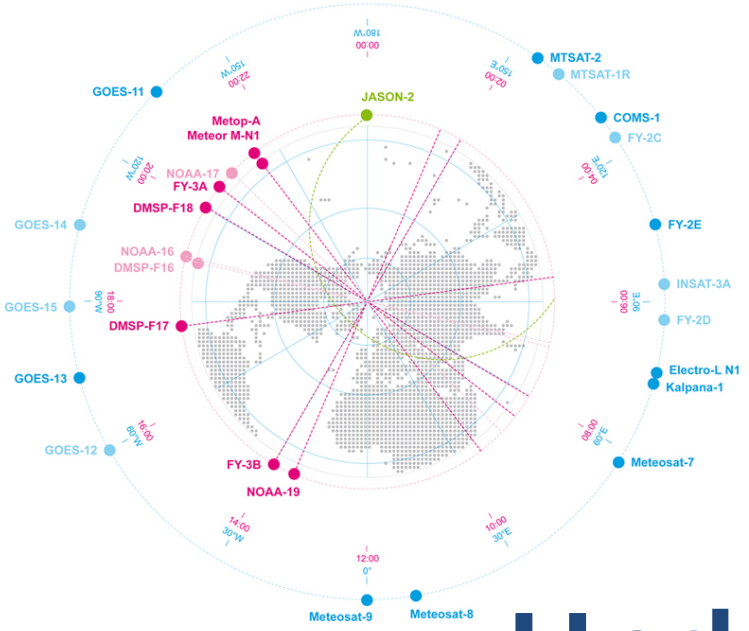


Update on EUMETSAT satellite programmes

Presented to CGMS-41 plenary session, agenda item D.1.2

Coordination Group for Meteorological Satellites

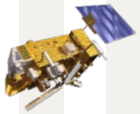
EUMETSAT

CGMS

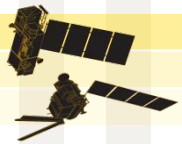
Overview - Planning of EUMETSAT satellite systems

YEAR... 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 30 31 32 33 34 35 36 37 38 39 40

METEOSAT FIRST GENERATION
METEOSAT-7
METEOSAT SECOND GENERATION
METEOSAT-8
METEOSAT-9
MSG-3/METEOSAT-10
MSG-4/METEOSAT-11*
METEOSAT THIRD GENERATION
MTG-I-1
MTG-S-1
MTG-I-2
MTG-I-3
MTG-S-2
MTG-I-4



EUMETSAT POLAR SYSTEM (EPS)
METOP-A
METOP-B
METOP-C
EPS-SECOND GENERATION (EPS-SG)
METOP-SG 1: SOUNDING & IMAGERY SATELLITES
METOP-SG 2: MICROWAVE SATELLITES



JASON
JASON-2
JASON-3
JASON CONTINUITY OF SERVICES (JASON-CS)

GMES
SENTINEL-3
SENTINEL-4 ON MTG-S
SENTINEL-5 ON METOP-SG 1

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EUMETSAT CGMS

MSG-3 (now Meteosat-10) and Metop-B became EUMETSAT primary satellites, after commissioning

MSG-1 (Meteosat-8) launch 28 August 2002

MSG-2 (Meteosat-9) launch 21 December 2005

MSG-3 (Meteosat-10) launch 5 July 2012

METEOSAT SECOND GENERATION

METEOSAT-8

METEOSAT-9

MSG-3/METEOSAT-10

MSG-4/METEOSAT-11*

YEAR... 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

EUMETSAT POLAR SYSTEM (EPS)

METOP-A

METOP-B

METOP-C

Metop-A launch 19 October 2006

Metop-B launch 17 September 2012

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CGMS

CURRENT SATELLITES IN ORBIT

METOP-A/B (98.7° incl.)

EUMETSAT POLAR SYSTEM/ Initial Joint Polar System

Mid-morning, sun synchronous orbit at 817km altitude

JASON-2 (63° incl.)

OCEAN SURFACE TOPOGRAPHY

Non-synchronous low Earth orbit at 1,336km altitude

Partnership with NASA/NOAA/CNES

METEOSAT-10 (0° LONGITUDE)
2nd generation

METEOSAT FULL DISC IMAGERY

Prime Meteosat full disc imagery service over the European continent, Africa and parts of the Atlantic and Indian oceans every 15 minutes

METEOSAT-9 (9.5E° LONGITUDE)
2nd generation

RAPID SCAN SERVICE

Rapid scan service over Europe every 5 minutes

METEOSAT-8 (3.5° EAST)
2nd generation

BACKUP SERVICE

METEOSAT-7 (57.5° EAST)
1st generation

INDIAN OCEAN DATA COVERAGE

Operated in support of the Indian Ocean Data Coverage (IODC) mission, bridging an observational gap in this region until end 2016

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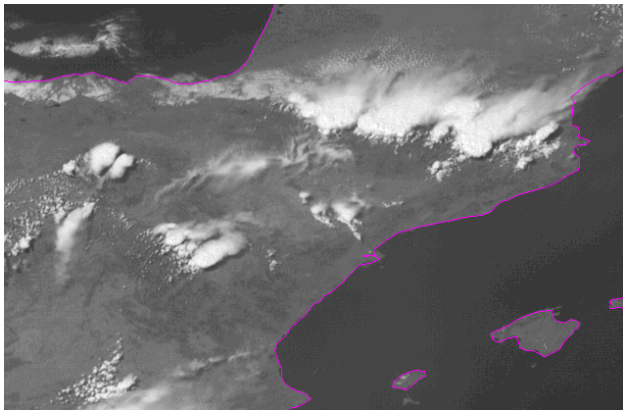
CGMS

Relocations of MSG spacecraft

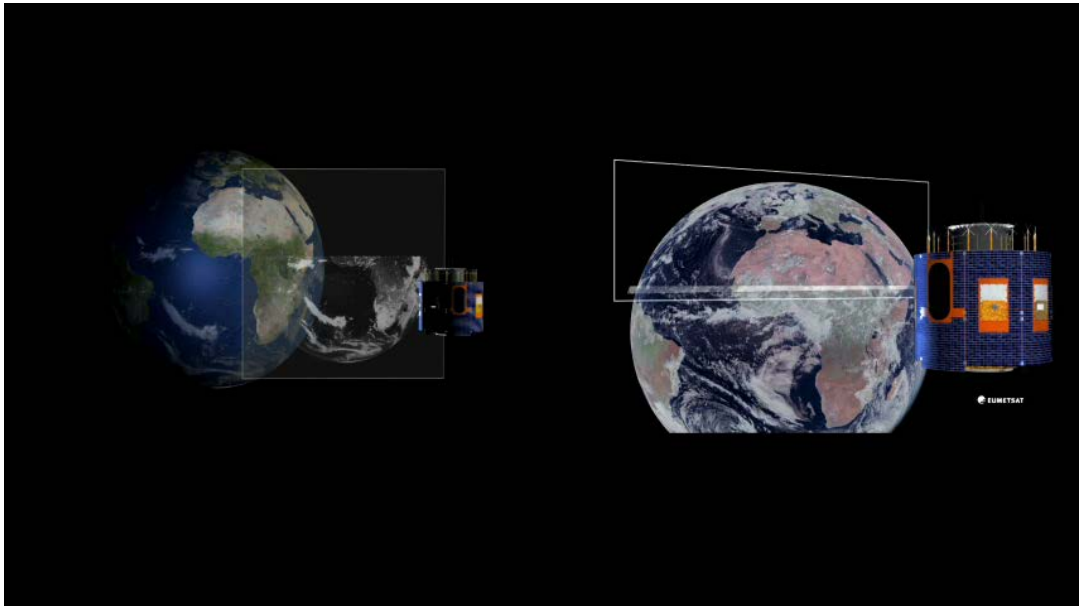
Continuity of RSS (48h/month)

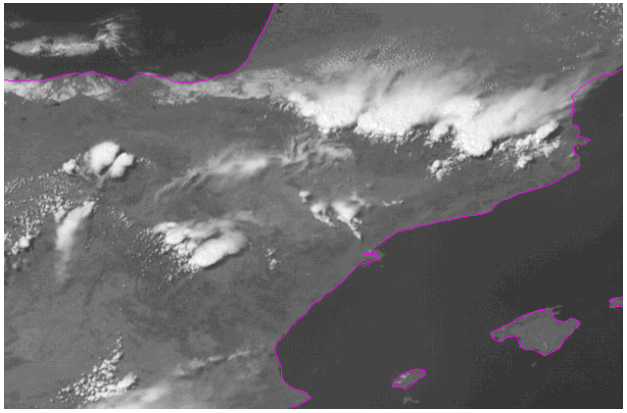
2.5 min. super rapid scan
(4 times max, 3 already performed)

CURRENT GEO SATELLITES – OPERATIONAL CAPABILITY OF A TWO-SATELLITE SYSTEM

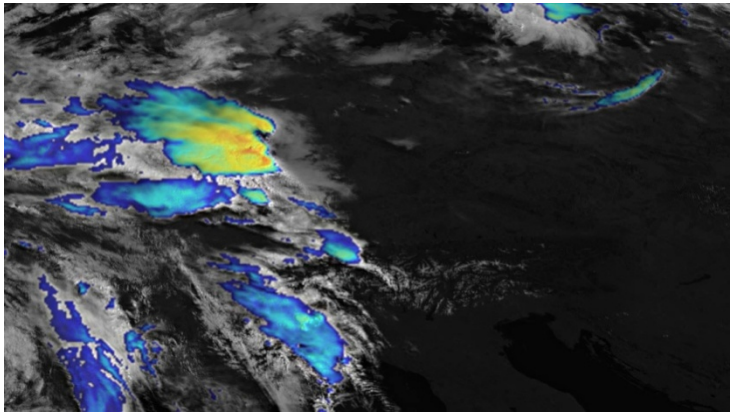


15 minute scan





5 minute rapid scan



2.5 minute super rapid scan
(MTG preparation)

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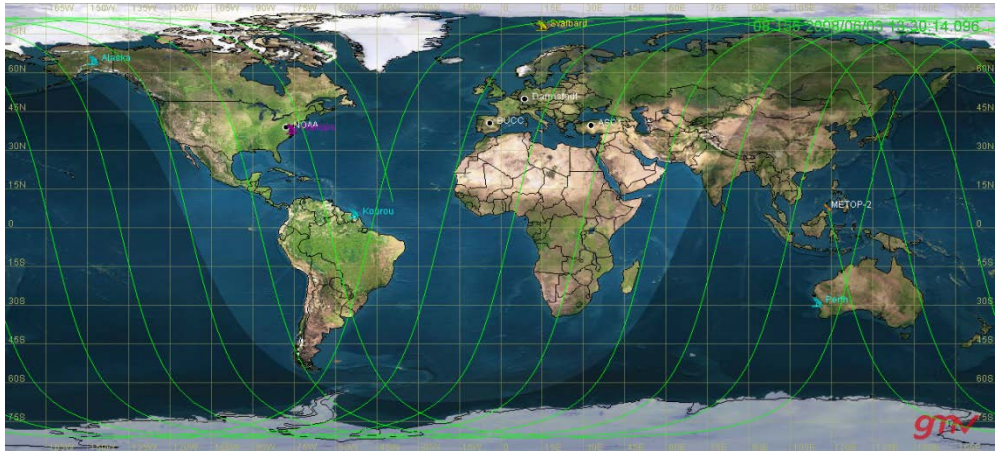
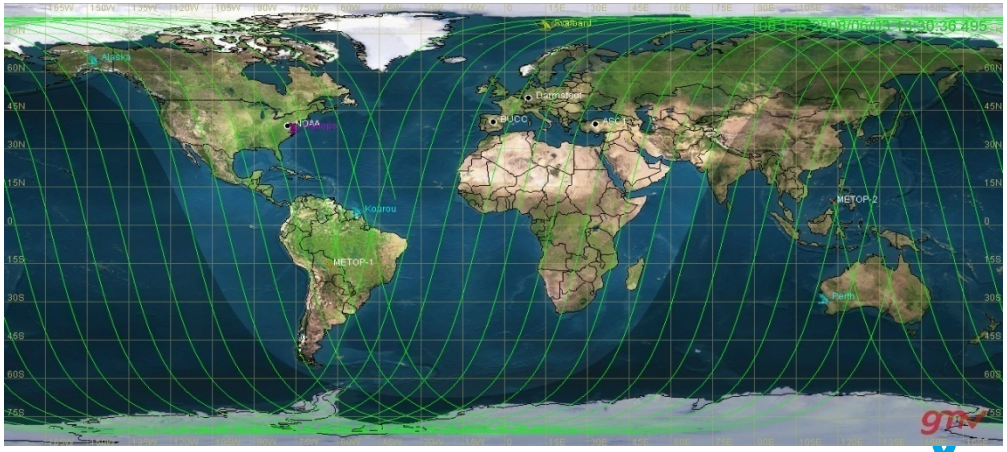
EUMETSAT CGMS

CURRENT LEO SATELLITES – DUAL METOP OPERATIONS

- Dual-Metop operational service
- Additional *temporary* benefits
  - Assimilation of data from both satellites in NWP models
  - GOME-2 increased resolution
  - Improvement to products
- Metop-A operations planned until launch of Metop-C (2018)
- Metop-A orbit controlled until 2016: degraded dual scenario TBD thereafter

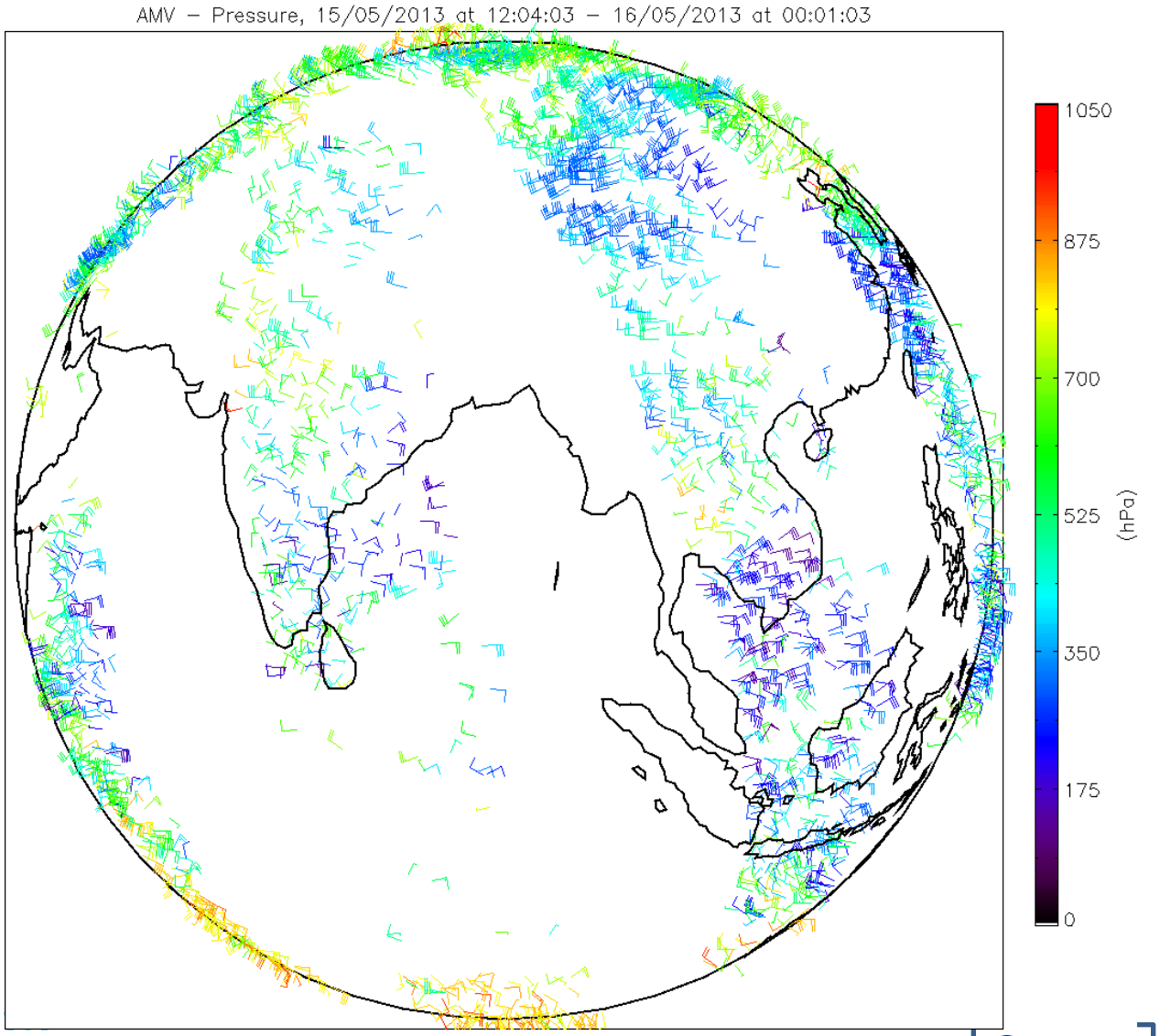


Single Metop ground track over 9 orbits



Dual-Metop ground track over 9 orbits

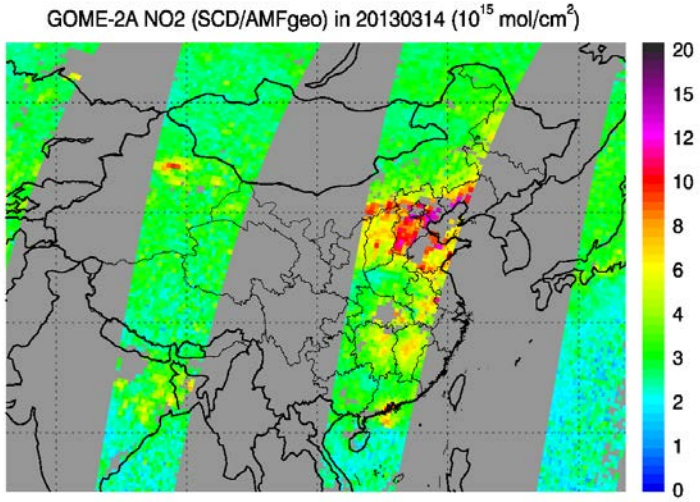
New product: global, dual Metop winds, 15 May 2013

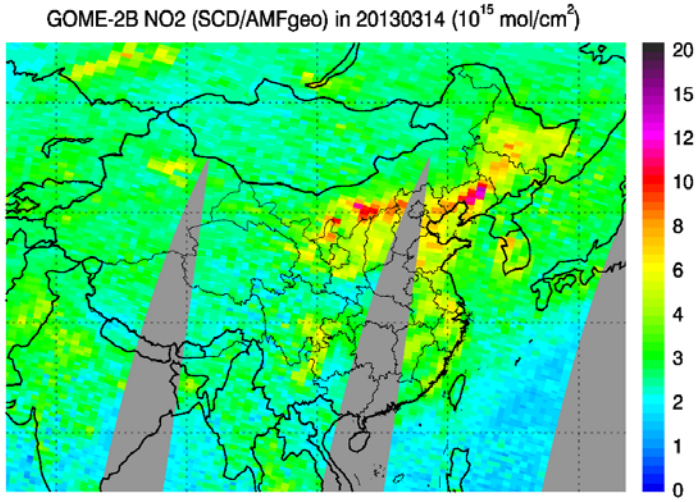


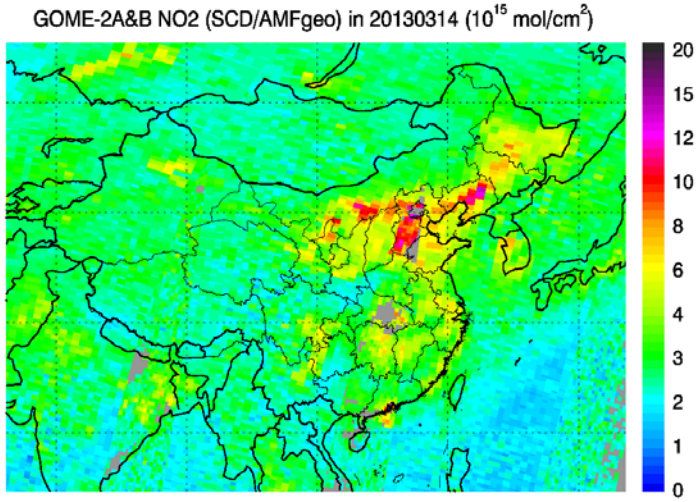
Coordination Group
Meteorological Satellites

EUMETSAT CGMS

GOME-2 Metop-A/B dual Operations: interim baseline







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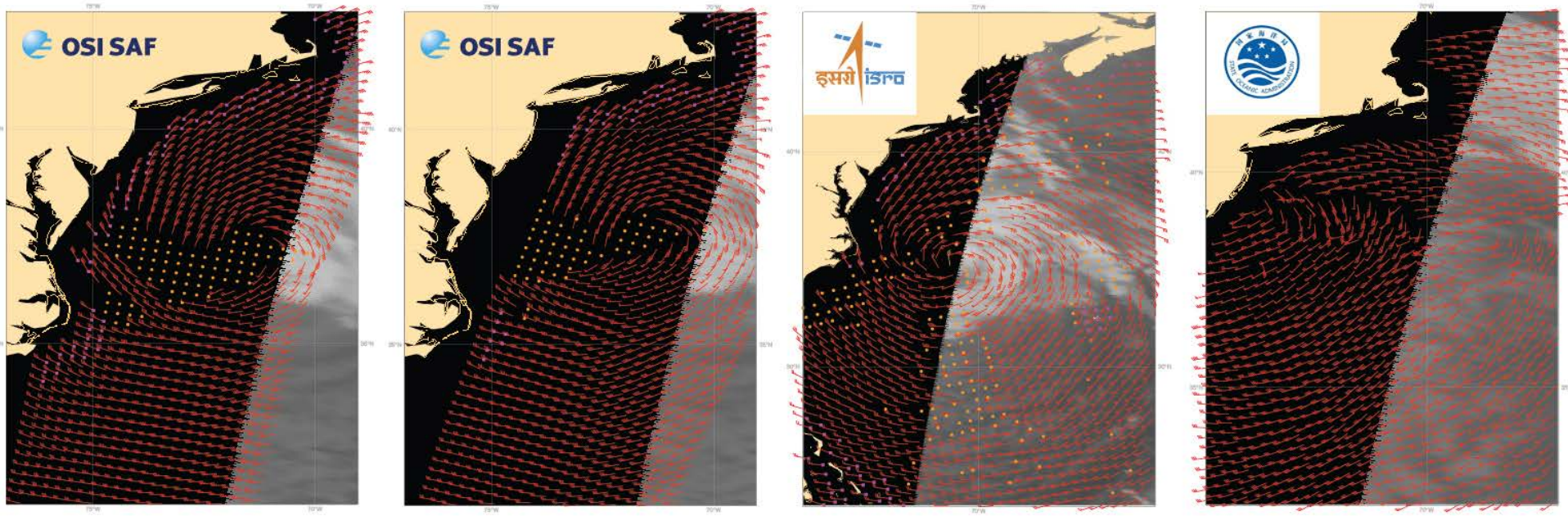
EUMETSAT CGMS

CURRENT LEO SATELLITES – THE BENEFITS OF INTERNATIONAL COOPERATION TO THE WORLDWIDE USER COMMUNITY / WMO GOS 2025



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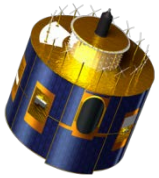
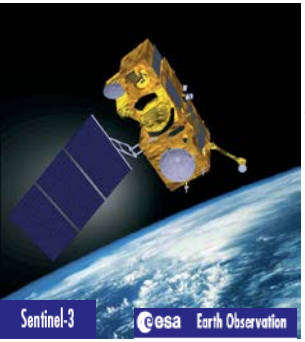
EUMETSAT CGMS

NEAR FUTURE - GEO AND LEO SATELLITES

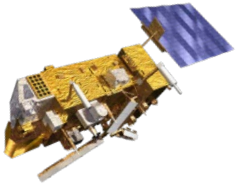


- **MSG-4** launch February 2015 (for in orbit storage)

- **Jason-3** launch (with CNES, NOAA, NASA) in March 2015



- EUMETSAT will operate **Copernicus Sentinel-3** (Marine Mission) after commissioning by ESA, end 2014

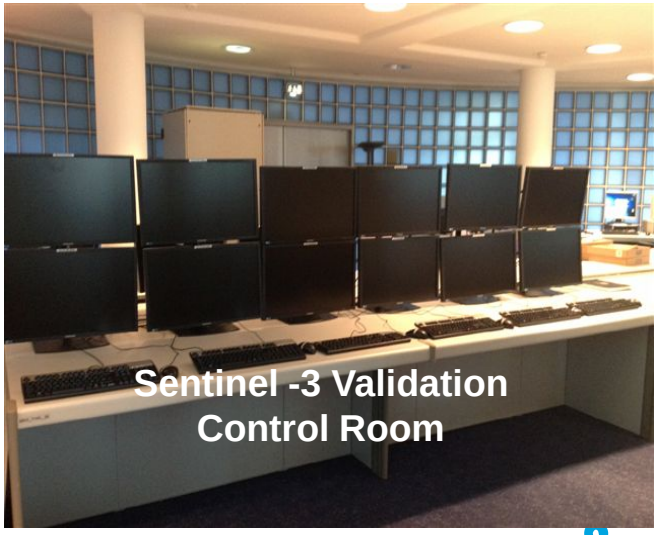


- **Metop-C** launch planned in February 2018

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

Sentinel-3 Ground segment under AIV at EUMETSAT Headquarters (Cooperation with ESA)



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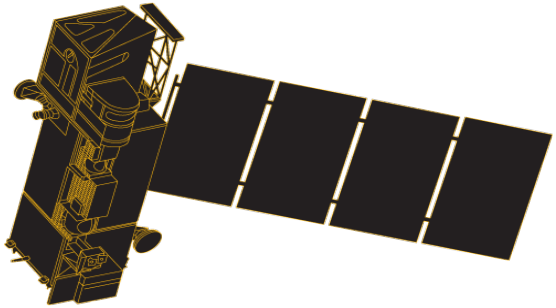
EUMETSAT CGMS

Future satellites and programmes: observations in 2018 – 2040

MTG: Approved, under development
Sentinel-4 approved

Jason-CS : Proposed, *to be approved in 2015*
Phase B2 approved at ESA CMIN12



EPS-SG : *to be approved in 2014*
Metop-SG programme approved at ESA CMIN12
Sentinel-5 Phase B2 approved at ESA CMIN 12

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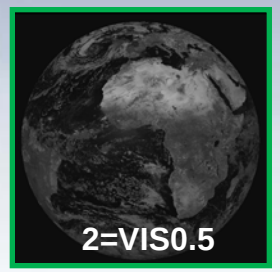
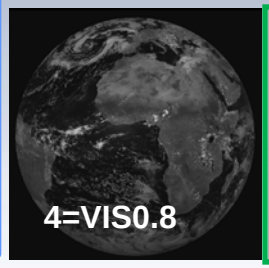
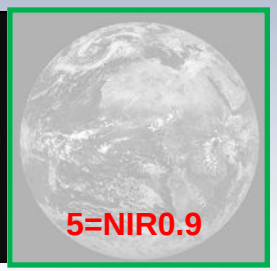
EUMETSAT CGMS

Spectral bands of FCI image onboard MTG-I

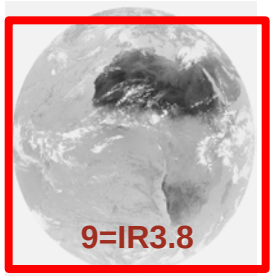


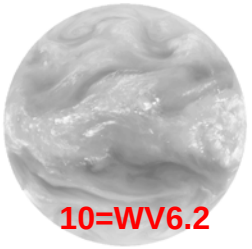


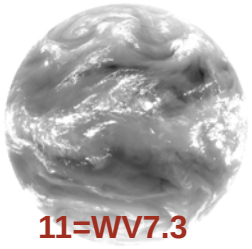


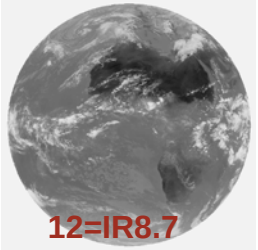
Vis/NIR channels available at 0.5 & 1.0 km Sampling

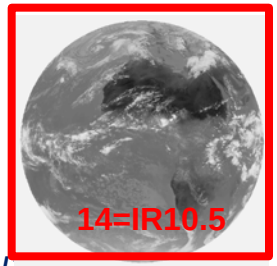
TOR channels available at 1 & 2 km sampling

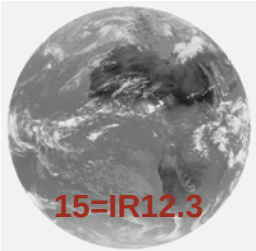




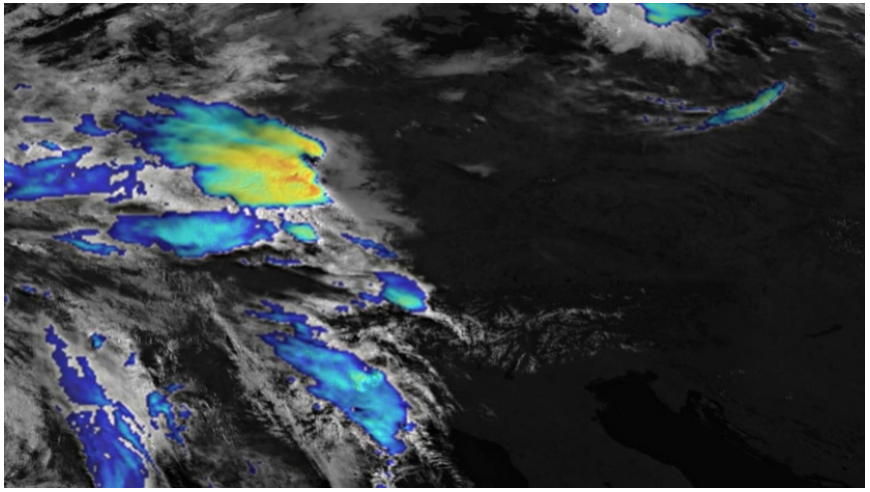




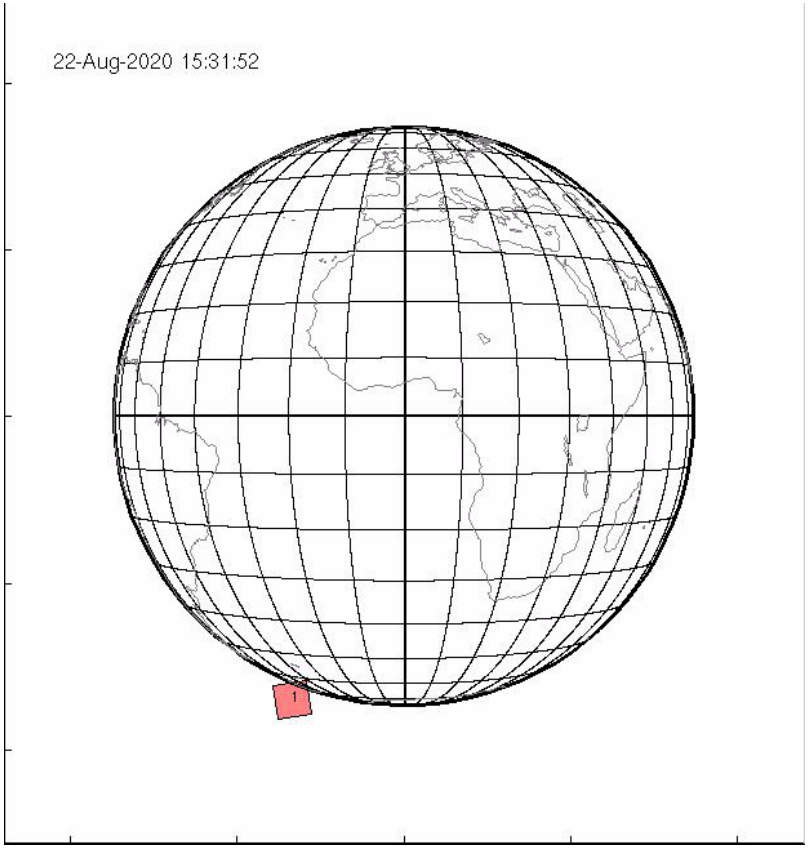




FCI fast imagery mission (MTG-I)



IR hyperspectral sounding mission (MTG-S)

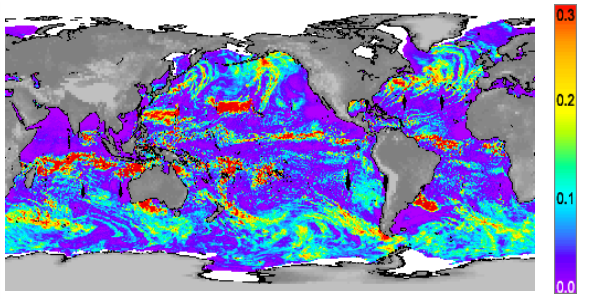


Europe covered every 30 minutes

MicroWave Imager (MWI) & Ice-Cloud Imager (ICI) on Metop-SG

- **MWI objectives**
  - Precipitation and clouds
  - Imagery and H2O profiles
  - Sea ice, surface snow

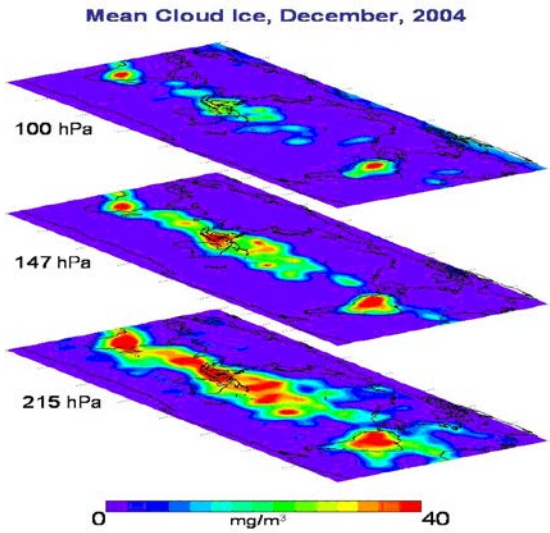
19 canaux (18.7 - 183 GHz)
- Continuity wrt SSMI/S
- Addition of sounding channels
  - Improve estimation of precipitation
  - Water vapour and clouds



Cloud Liquid Column mm

- **ICI objectives**
  - Nuages (ice phase)
  - Detection of snow

11 channels (183 – 664 GHz)
- First operational ice cloud imagery mission
- Meteorology and climate (Cirrus)



NASA: Aura/MLS

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EUMETSAT CGMS