EUMETSAT

Hyperspectral Level 2 Status and Schedule

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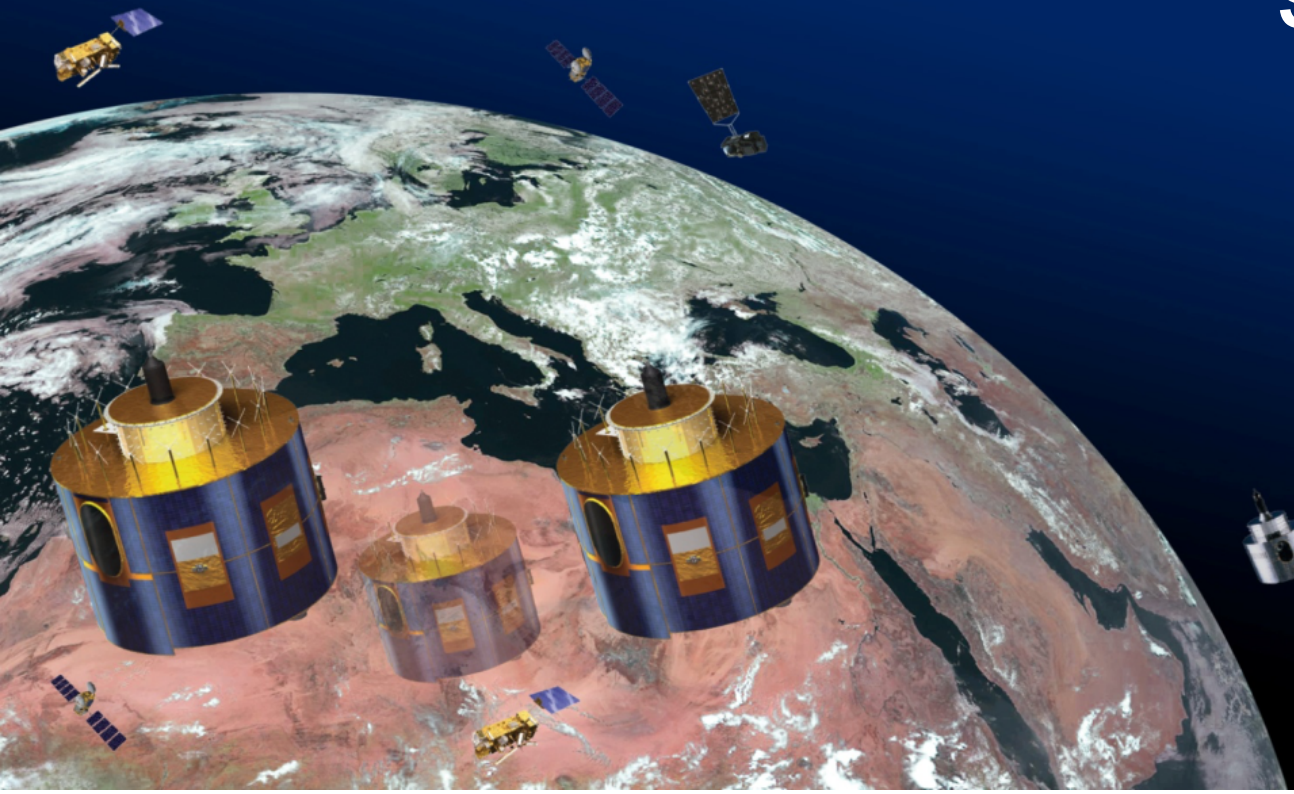


EUM/STG-SWG/43/17/VWG/21

Purpose and Context

- This presentation covers the short- and medium-term activities related to the Hyperspectral Level 2 commitments of the Secretariat, i.e. 2017 – 2020.

- The medium- to long-term product (e.g. GHG) and application developments (e.g. convection) are partially addressed, but will be consolidated at a later date.

Hyperspectral Roadmap Elements

- Hyperspectral Roadmap Elements and Priorities
  1. Assure and continue Operations
  2. Develop continuity and future applications
  3. Assure supporting science activities and data
     - Spectroscopy and Radiative Transfer
     - Reference and Validation data, Fiducial Data
  4. Increase/improve maintainability (across missions)
  5. Aim at interoperability (with partners)

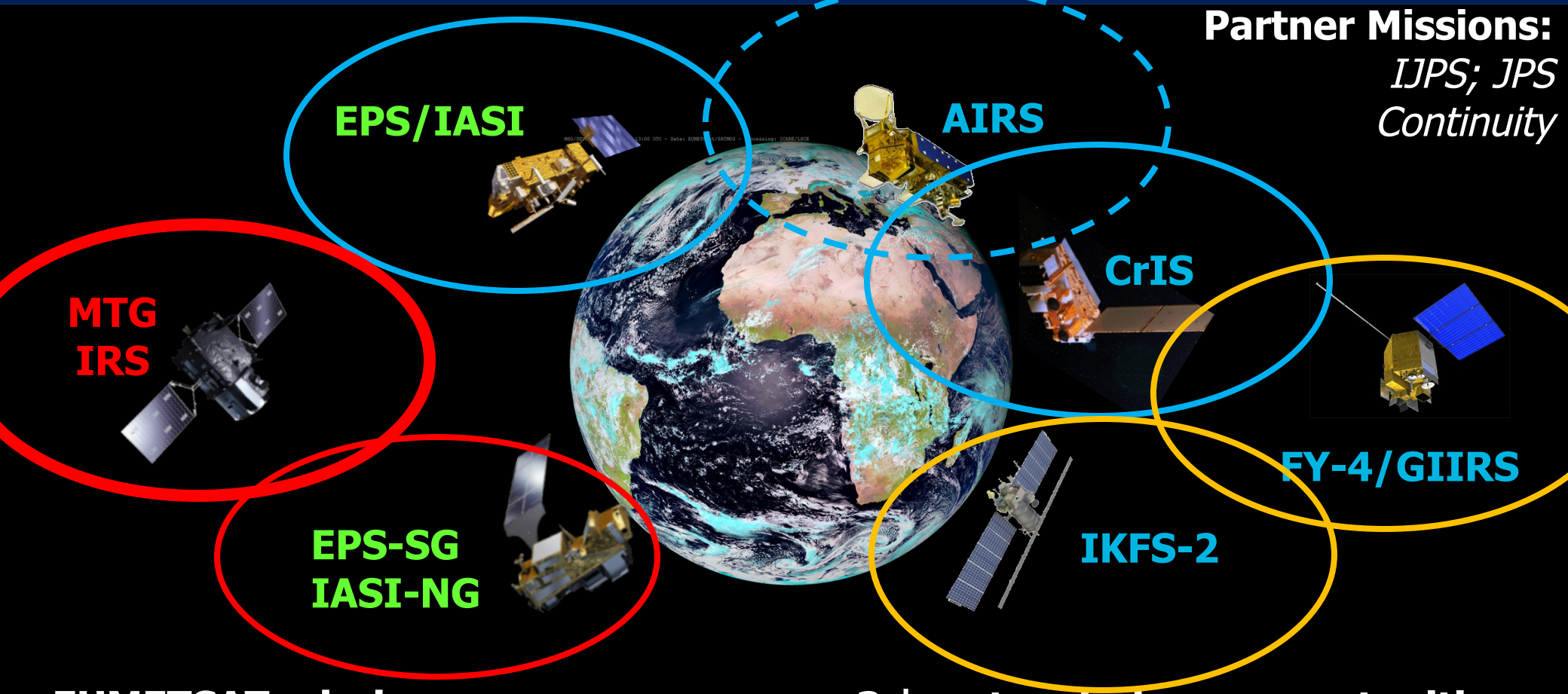
Drivers and Constraints

- End User Requirements
- Evolving Science and IT capabilities
- Constraints on available resources:
  - Available Personnel for Operations and Maintenance
  - Available Personnel for Development
  - Available Personnel for Reprocessing and Climate

Current provision of service by EUMETSAT and cooperation with partners

- From Polar Orbit by EUMETSAT Polar System (EPS)
  - Currently IASI on Metop-A and Metop-B
  - In the near future (late 2018) in addition IASI on Metop-C
- Cooperation with partners
  - NOAA with IJPS/JPS (CrIS) - *Cooperation proposed and being discussed, consistent with Framework Agreement signed in 2013 and JPS Agreement*
  - CMA – *Initial focus on calibration*
  - etc.

Current and planned hyperspectral missions



Partner Missions:
IJPS; JPS
Continuity

EUMETSAT missions:
Operations
Products & Services
Continuity

3rd party missions, opportunities:
Cooperations inter-agencies
Test prototype concepts
Extend EUMETSAT services

Priorities for Hyperspectral Activities (1)

- LEO Satellites
  - Short Term:
    - Assure and continue Operations: IASI on Metop-A (up to 2021/22) and Metop-B (up to 2023)
    - Commission and assure IASI service of Metop-C (2018-2028)
  - Mid-Term:
    - Assure EPS-SG IASI-NG L2 on Metop-SGa (Metop-SGa-1 to be launched in 2021)

Priorities for Hyperspectral Activities (2)

- GEO Satellites – **New for EUMETSAT**
  - Short- and Mid-Term:
    - Assure IRS-L2: support specification, development and take ownership (MTG-S1 to be launched in 2022)

Priorities for Hyperspectral Activities (3)

- All Systems
  - Assure consistency, maintainability and interoperability (across systems)

Hyperspectral Tasks and Priorities

Operations - OPS

1

Operational processing

Monitoring definition, implementation and update

Anomalies support

Preparation and support to future operations

3

Climate

User desk support

Resources

Programs - PRD

2

Mission definition and specification

Prototyping, implementation and testing
Sensitivity studies

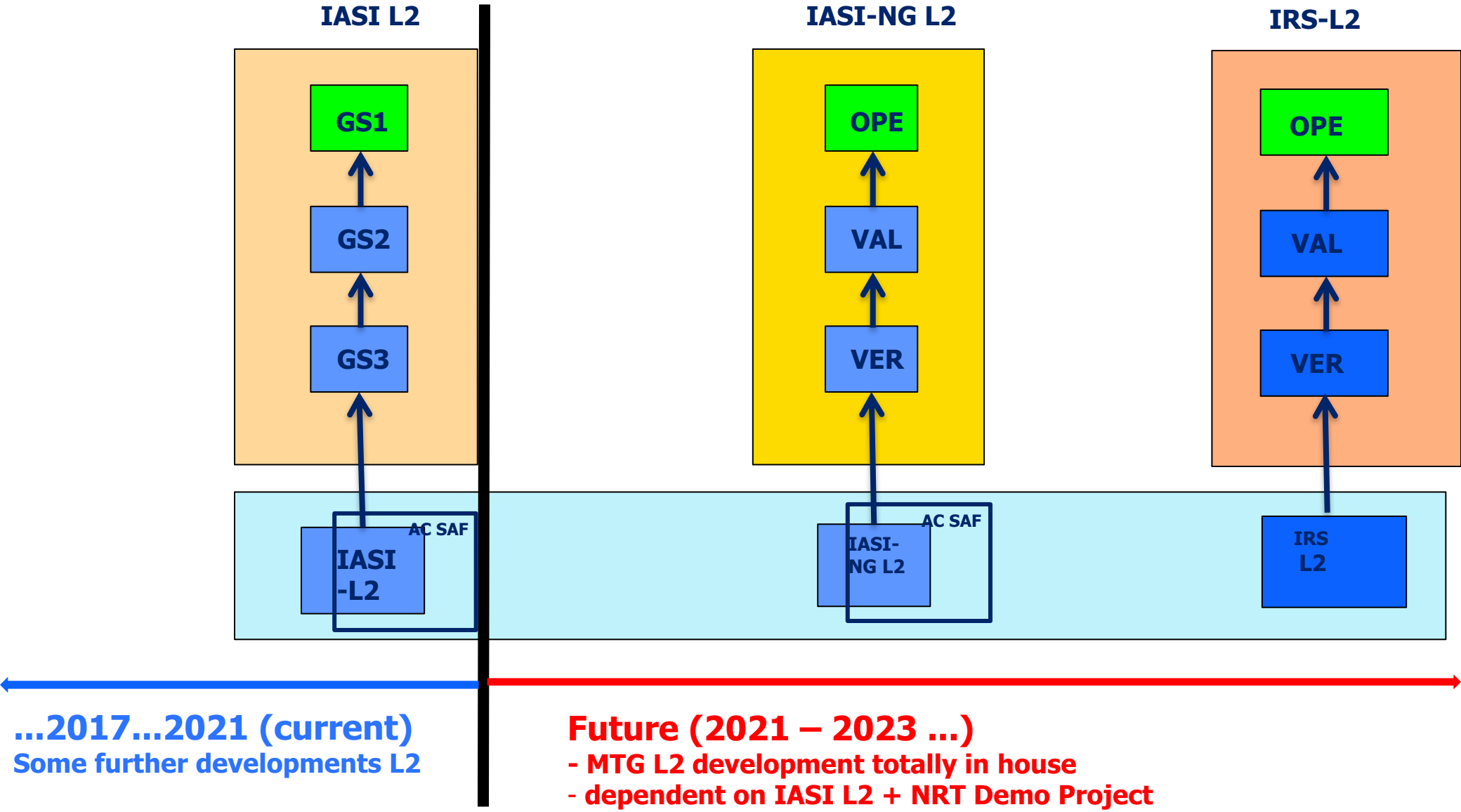
Operational development

Science working groups/MAGs

4

Interactions with other international calibration groups
Interactions with partner agencies

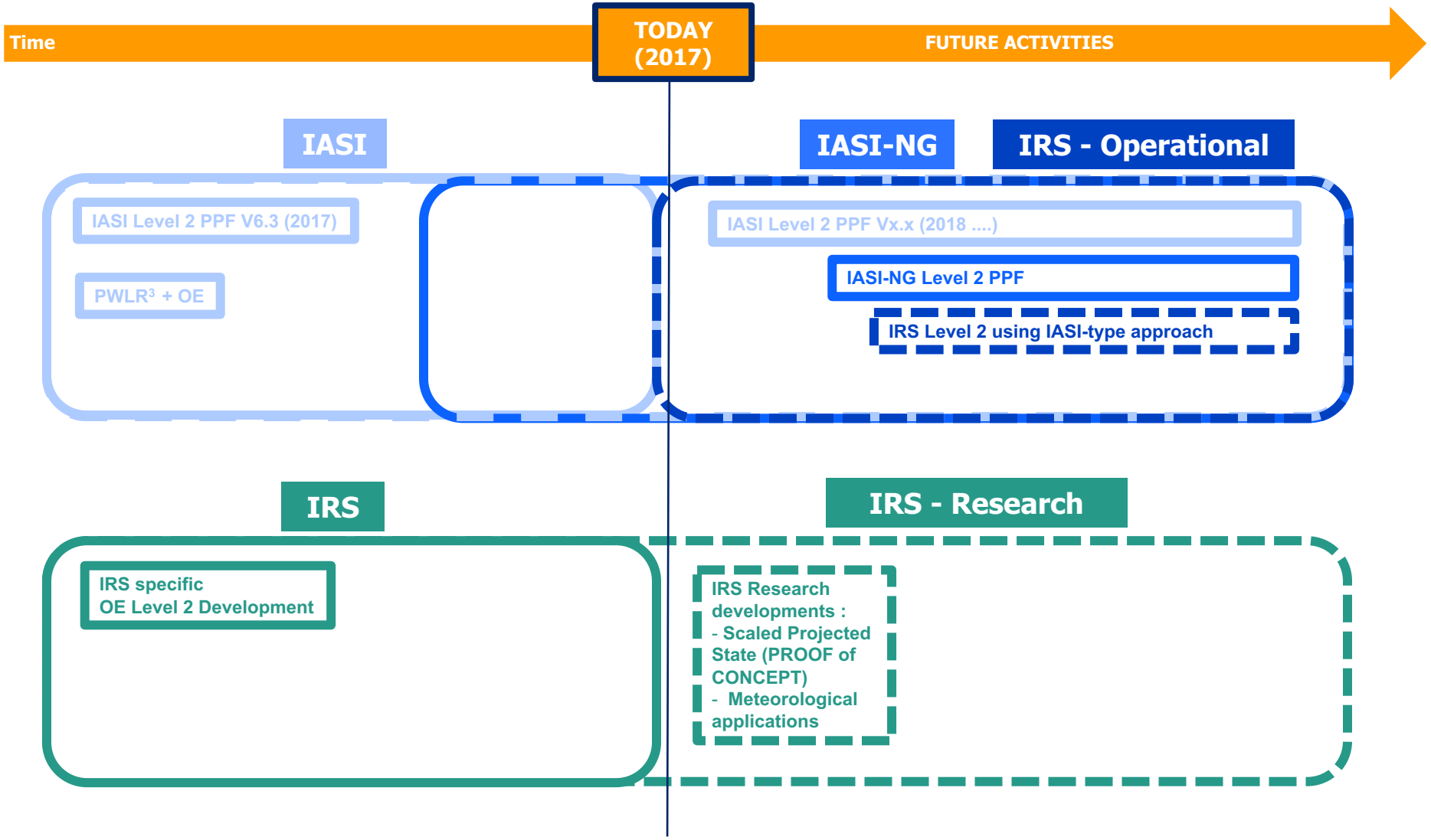
Operational Environments in 2017-2021-2023 ...



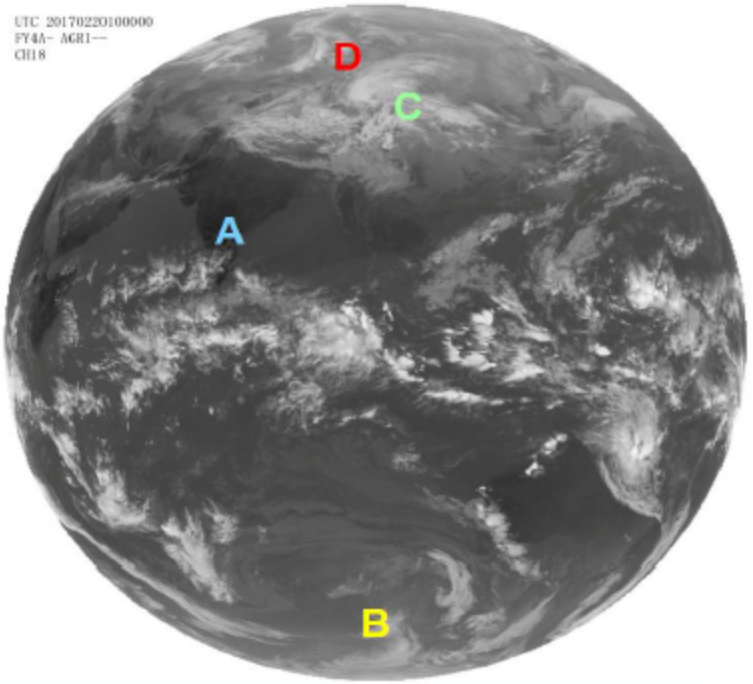
...2017...2021 (current)
Some further developments L2

Future (2021 – 2023 ...)
- MTG L2 development totally in house
- dependent on IASI L2 + NRT Demo Project

Level 2 Situation and Roadmap



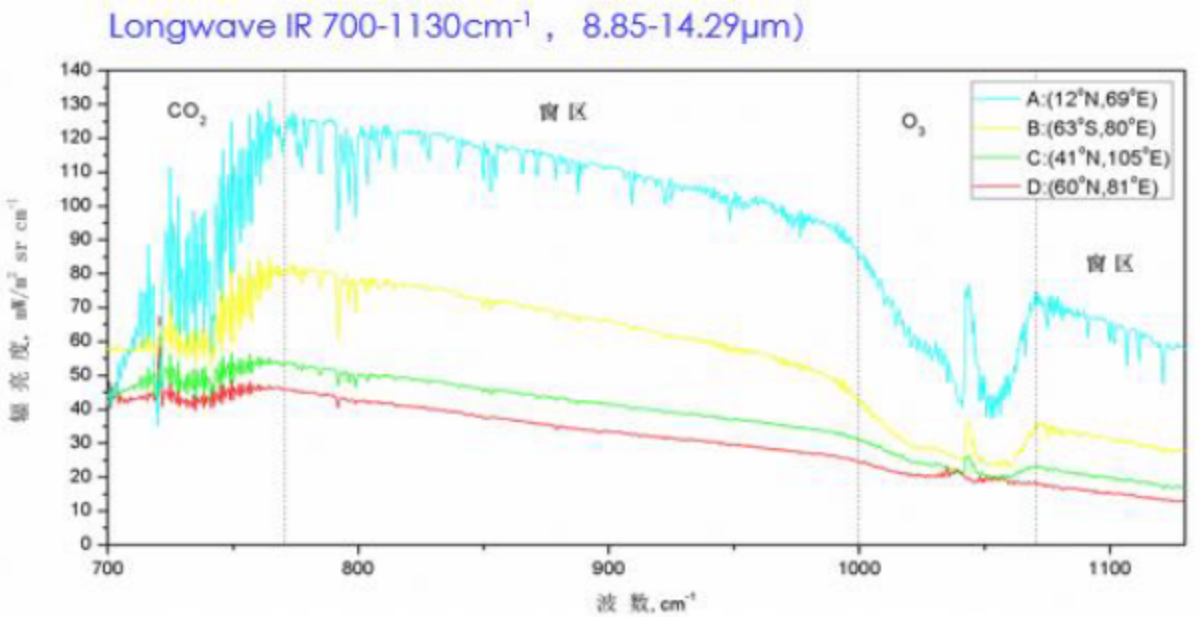
Context of IRS observations (2)

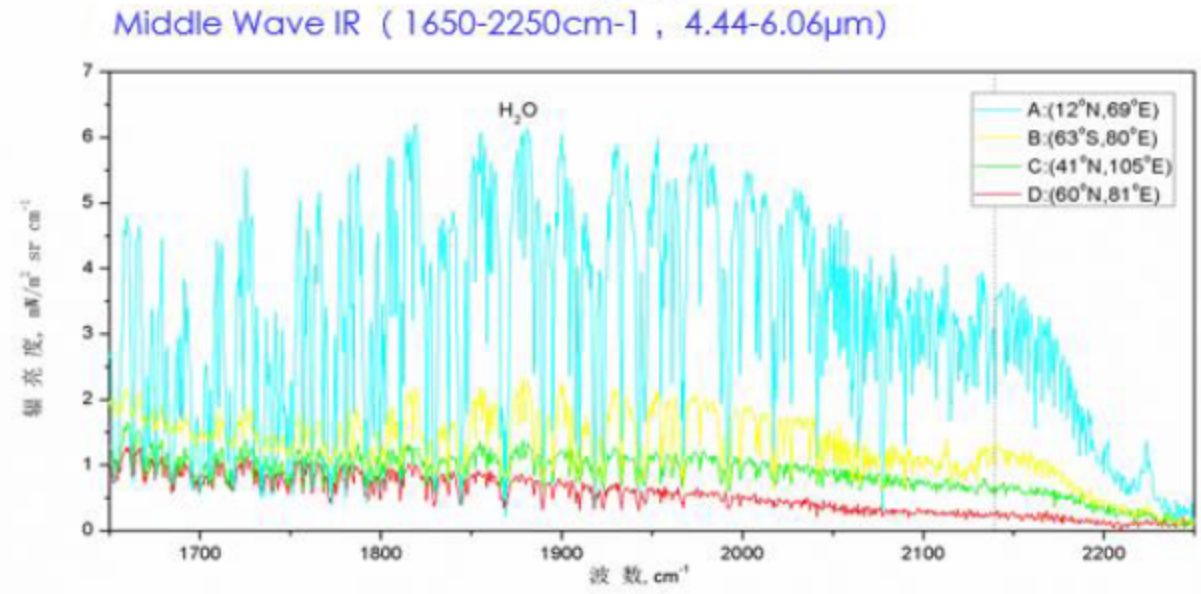


Spatial resolution: 16 km

Spectral resolution 0.625 cm^{-1}

From CMA FY-4A





Roadmap Supporting Elements (1)

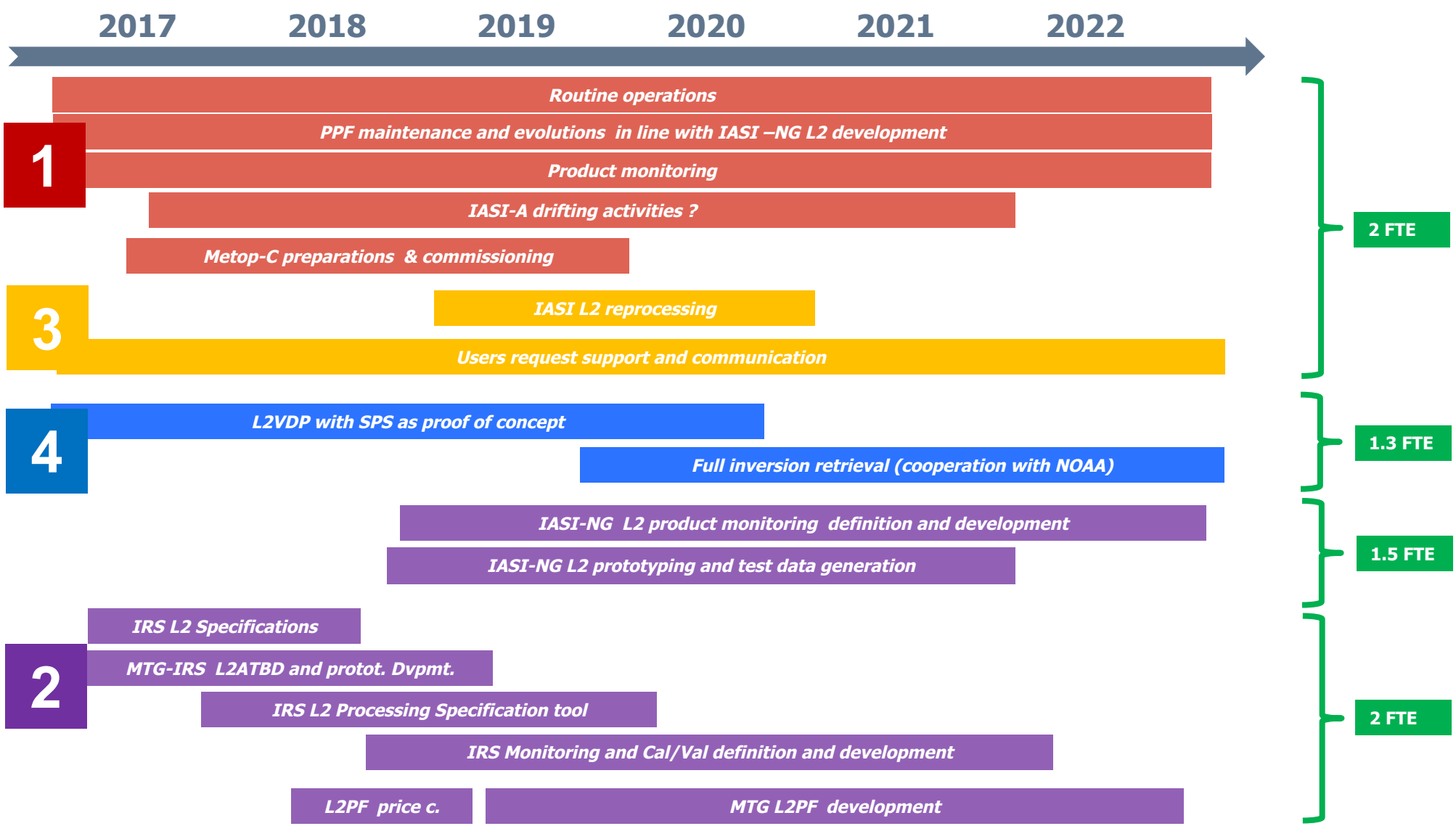
- Assure supporting science activities and data
  - Spectroscopy
    - Further develop spectroscopic knowledge
    - Spectroscopic assessment tools (e.g. SPARTE (Spectroscopic Parameters and Radiative Transfer Evaluation)
    - Spectroscopic data bases maintenance and evolution

Roadmap Supporting Elements (2)

- Radiative Transfer Models:
  - Support evolution of models for GEO (i.e. RTTOV)
  - Assessment of Radiative Transfer Models with new spectroscopy (LBL and FRTM)

- Reference and Validation data, Fiducial Data
  - In-situ measurement data
  - Data bases like ARSA, TIGR, etc.
  - Specific campaigns

Level 2 activities from 2017 to 2022



Future Hyperspectral Roadmap Elements for 2020-on

- Support further development and Improvement of Applications (Foster maximum use of Data)
  - Greenhouse Gases
  - NWP assimilation of L1
  - NWP assimilation of L2
  - Humidity analysis
  - Instability
  - Aviation related products
  - Marine related products

Conclusion/Outlook

- Hyperspectral activities **driven by User Requirements**
- **Need** for **common** processing modules
- **Need** for **interoperability** with/for partners
- Initial heritage programme approaches **impose** a **staggered** approach
- Increased focus on **New products and Applications in the long-term**