EUMETSAT

Moving from MODIS to VIIRS: evolutions of EUMETSAT implementation of the GSICS DCC algorithm

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** Telespazio support*

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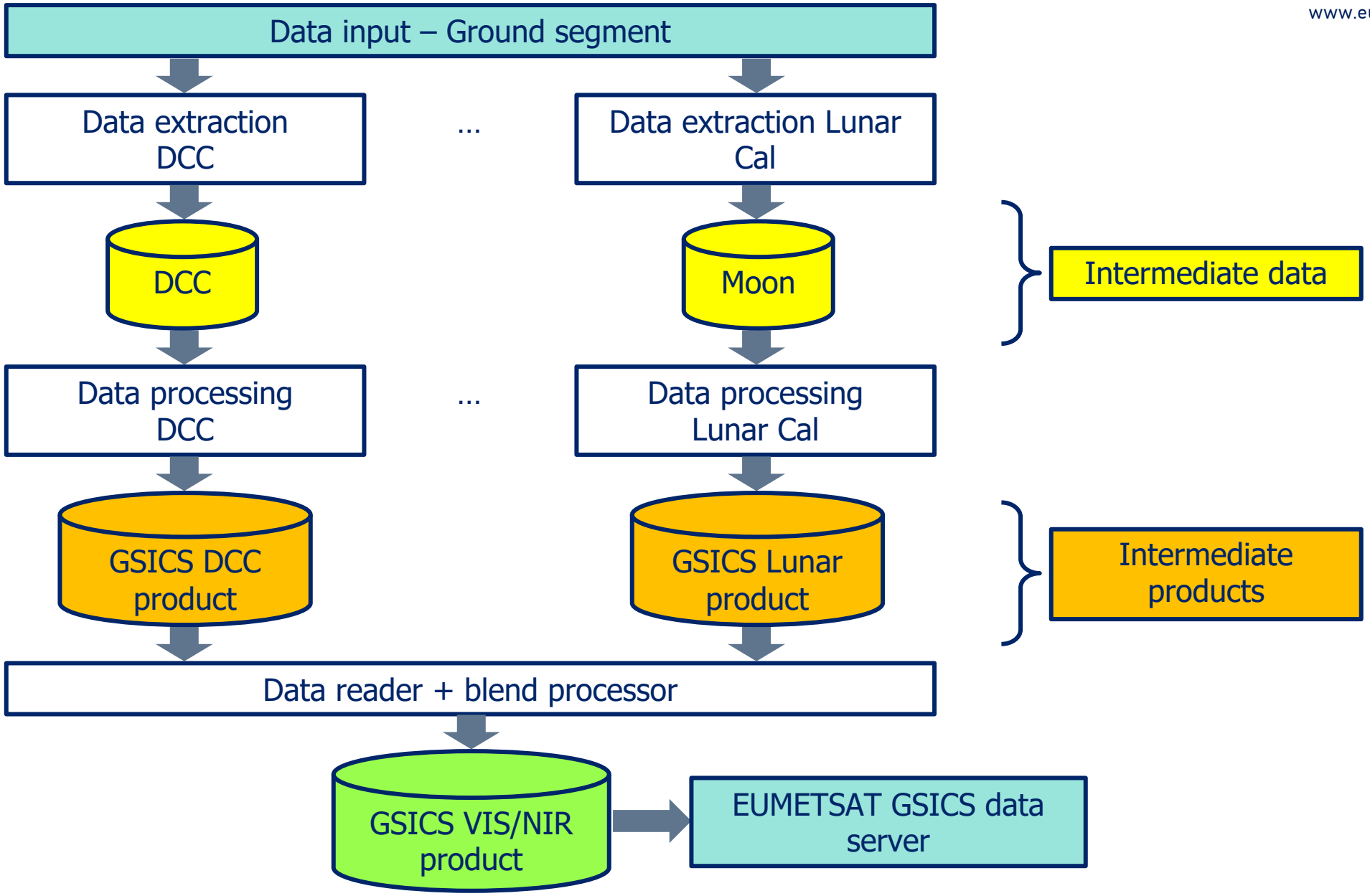
EUMETSAT concept for GSICS VNIR product generation



Legacy system and evolutions

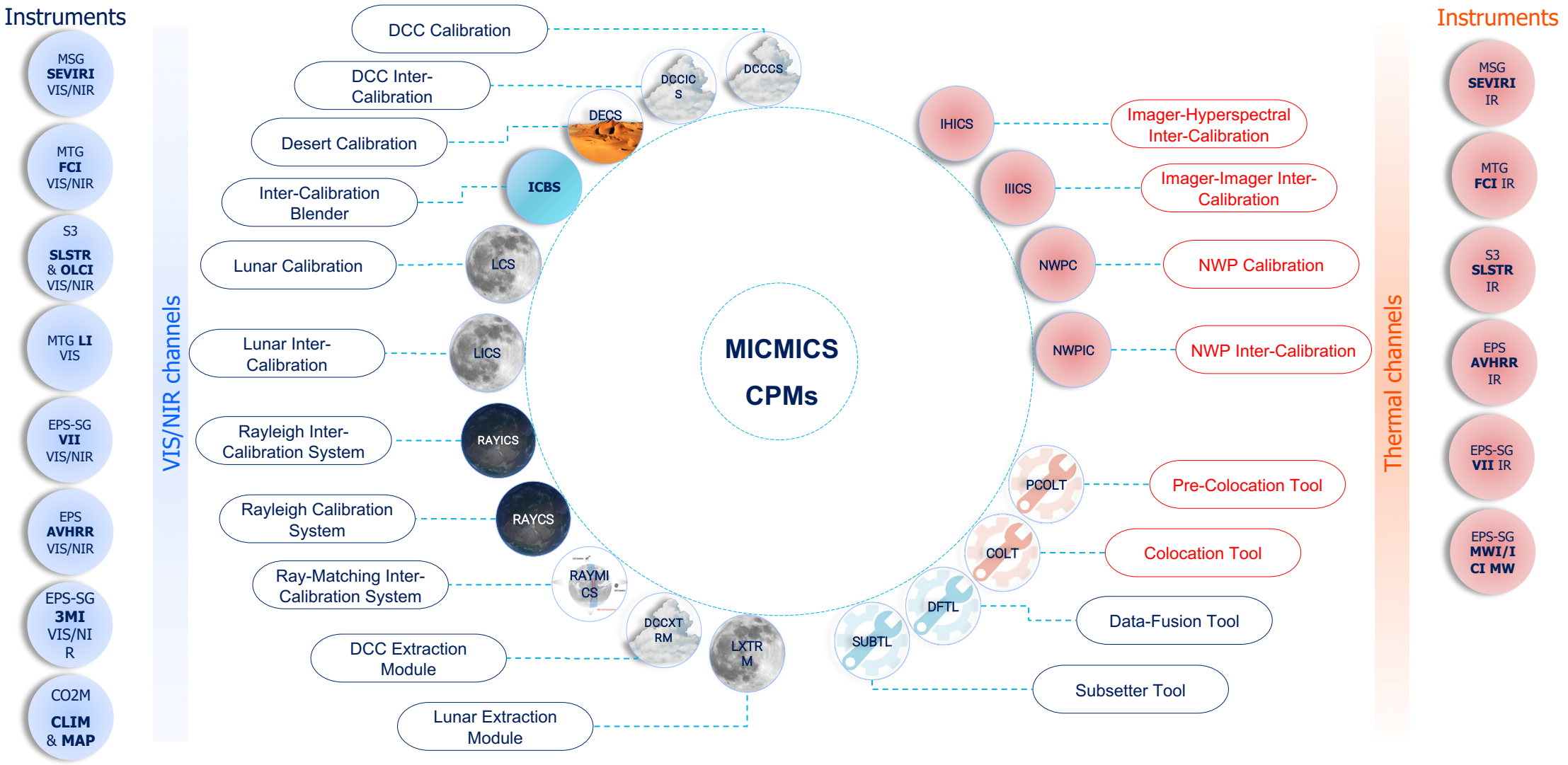
Current EUMETSAT GSICS products for VNIR:

- Based on DCC only ➔ GSICS DCC ATBD
- Automated stand-alone system running every day (over a 30-day sliding window)
- Software coded in Perl / IDL / C++
- Missions / channels in scope: MSG/SEVIRI VIS0.6 at (0, 0), (41.5E, 0) and (45.5E,0)
- Reference instrument: MODIS Aqua
- GPPA status = demonstration

New system being developed = MICMICS

- Brand-new multi-mission / multi-function framework running every day (over a 30-day sliding window) ➔ should it be adjusted with the change to NOAA-20/VIIRS?
- Software coded in Python
- Missions / channels in scope: geostationary imagers + polar imagers / all channels up to ~1 μm (and beyond to try…)
- Reference instrument: NOAA-20 VIIRS

MICMICS: Mission Integrated Calibration Monitoring & Inter-Calibration System



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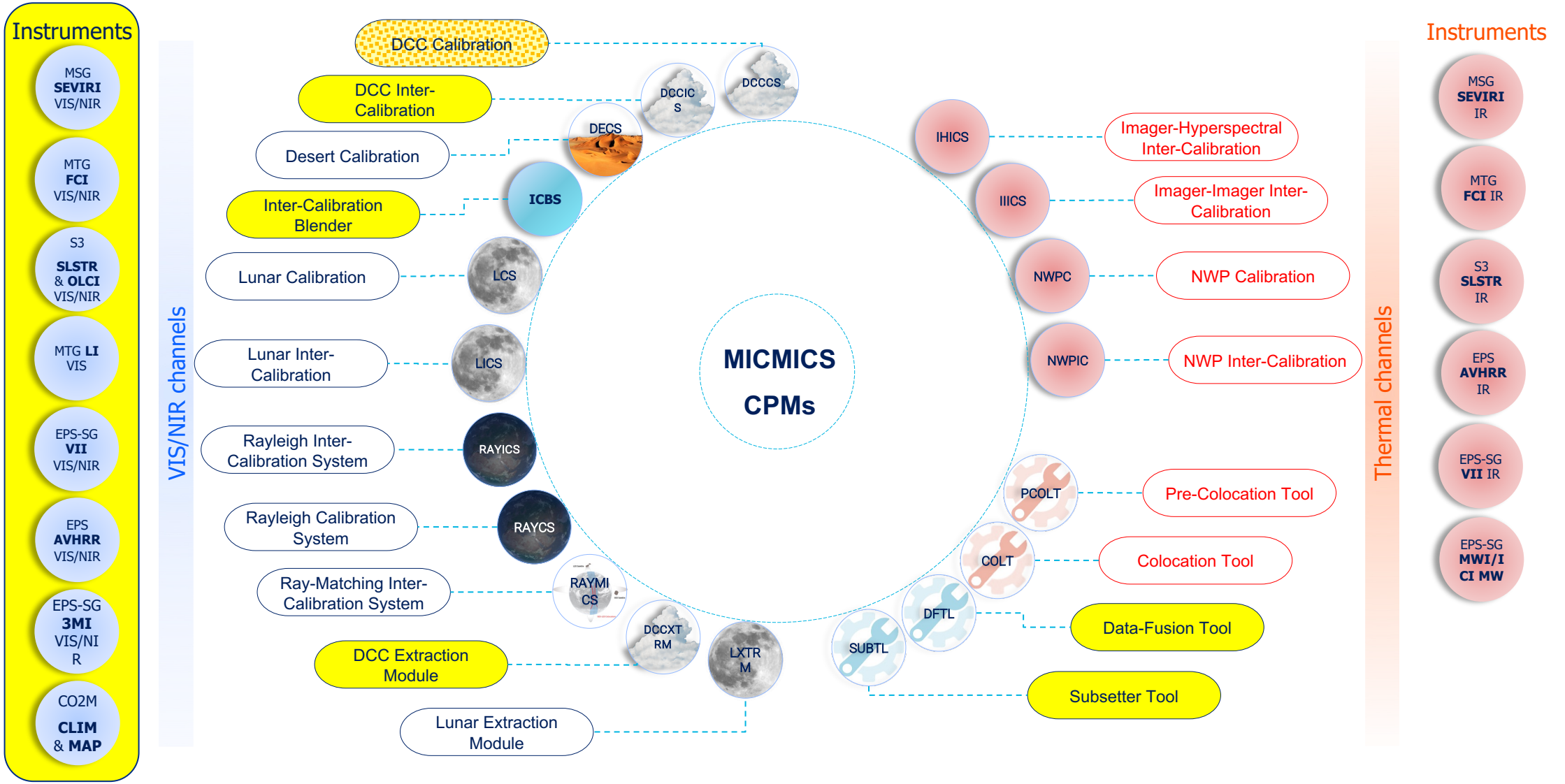
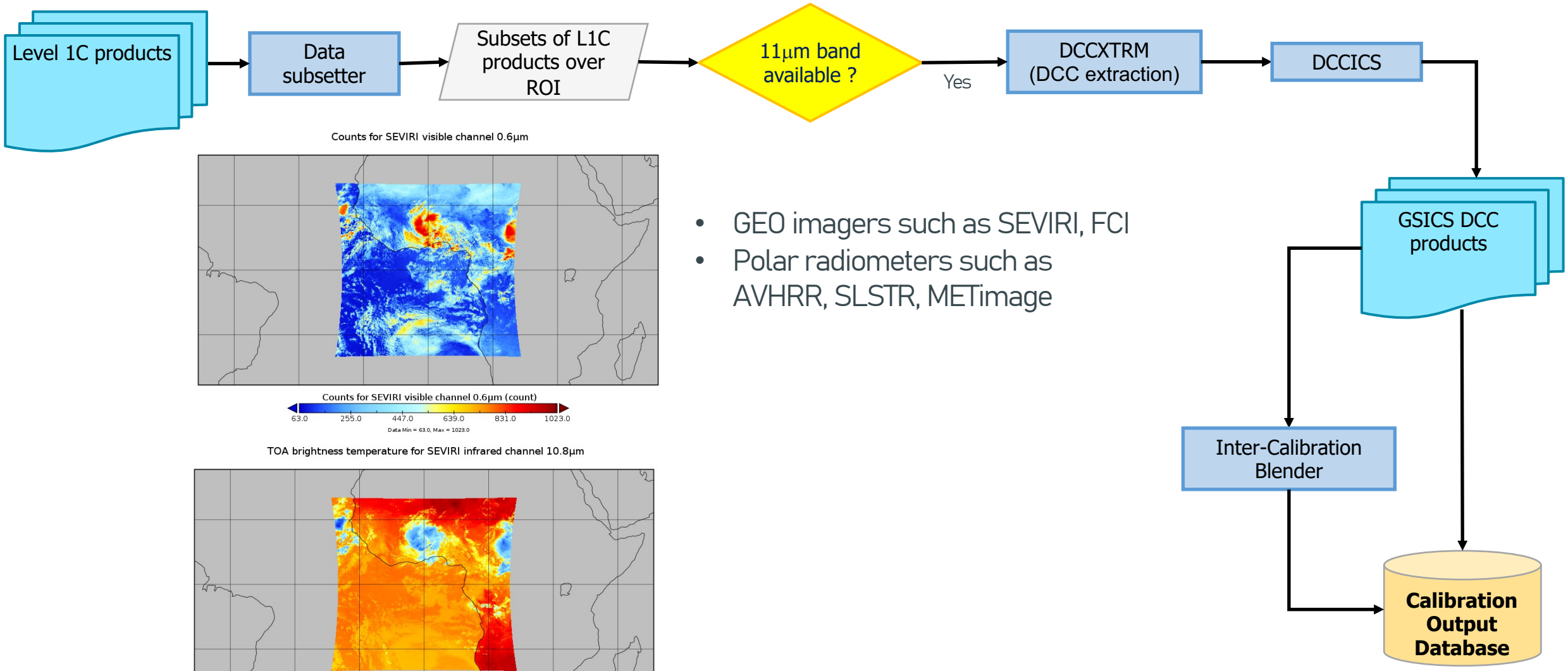
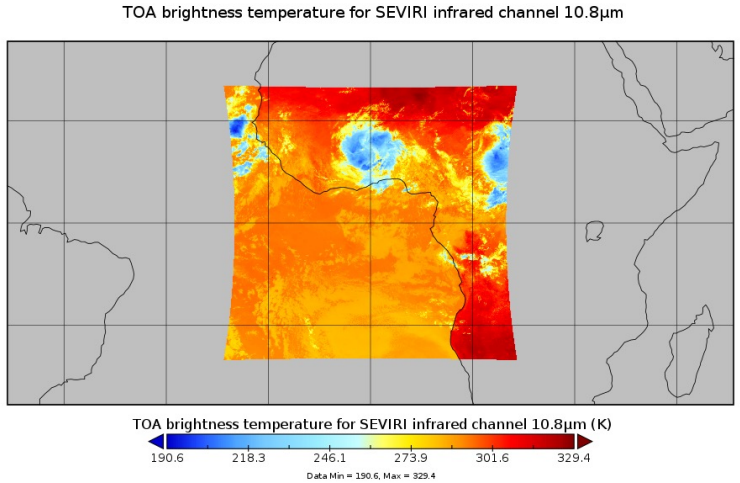


MICMICS DCCICS workflow

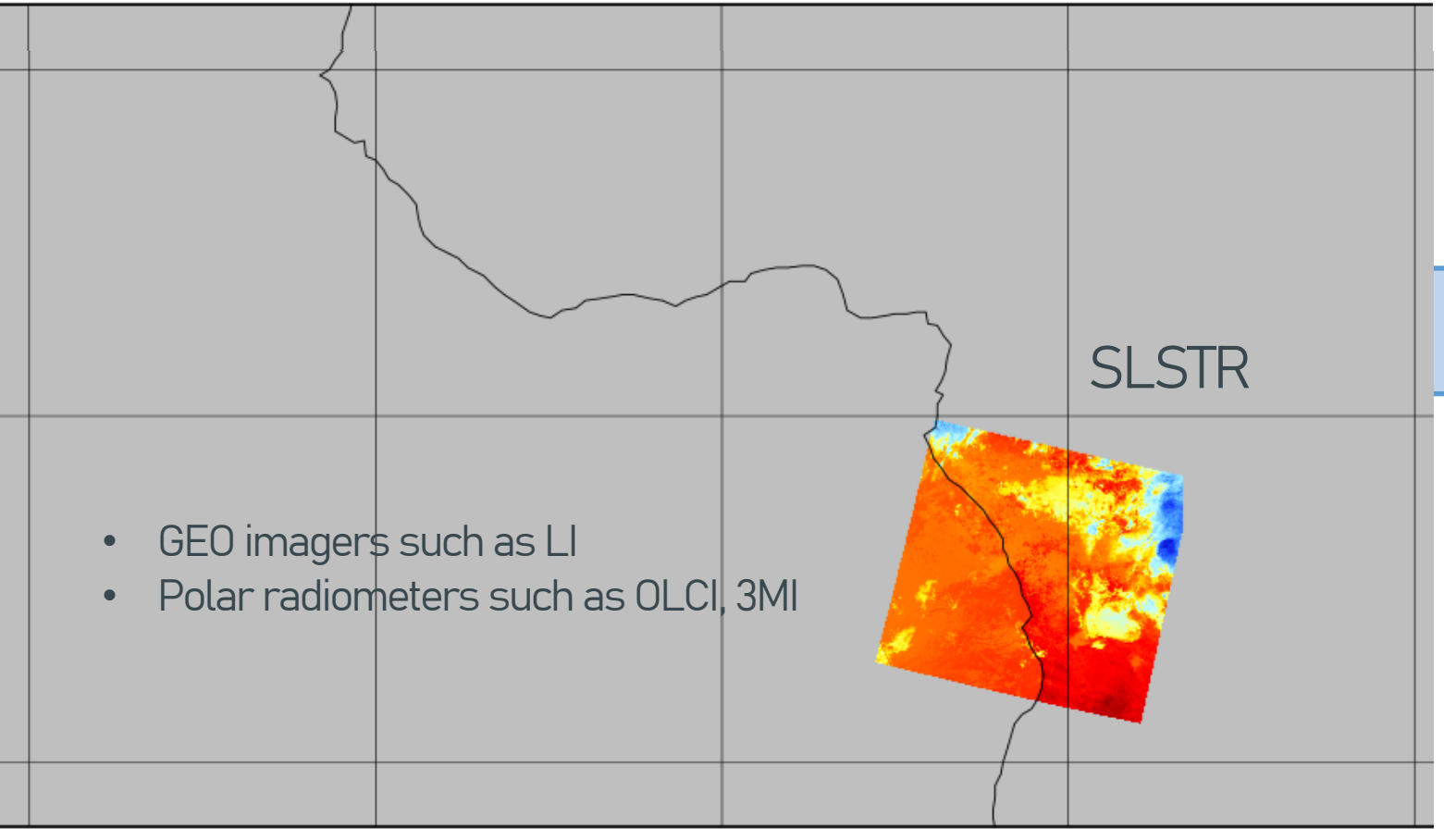




- GEO imagers such as SEVIRI, FCI
- Polar radiometers such as AVHRR, SLSTR, METimage

MICMICS DCCICS workflow

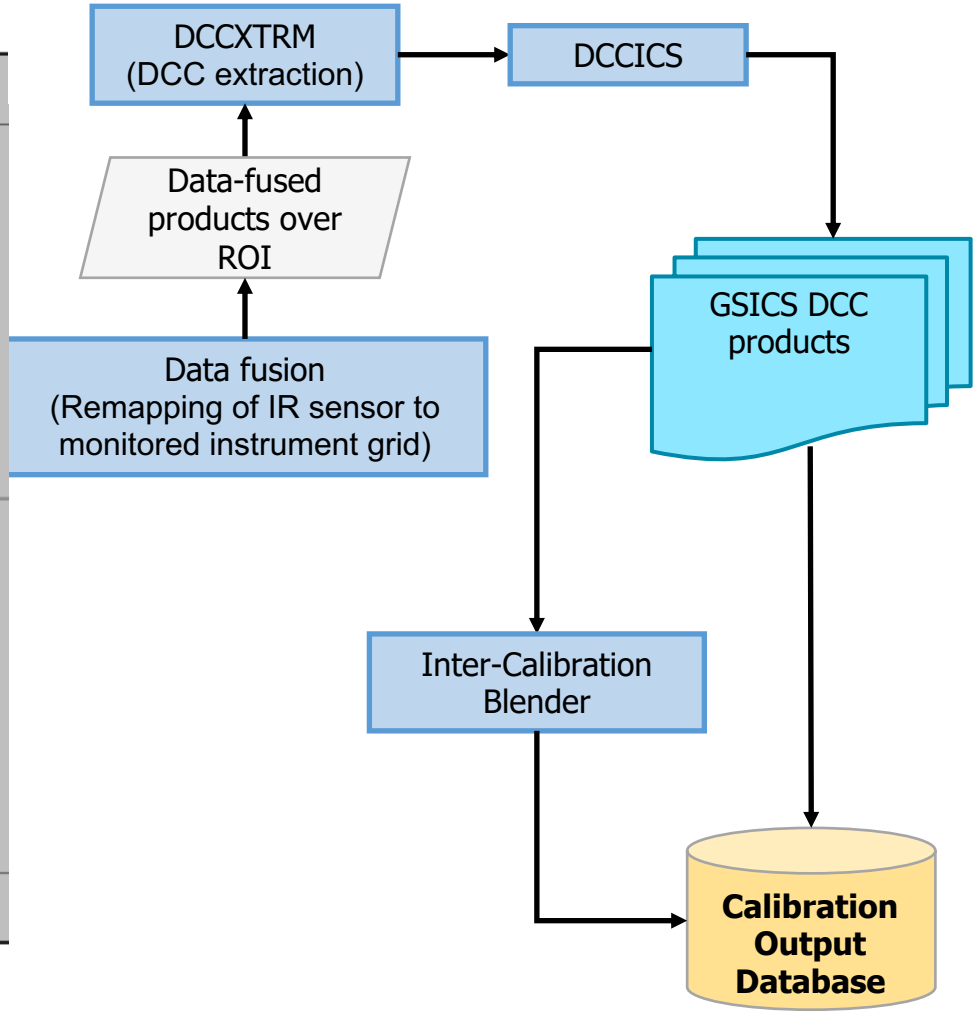
(1km TIR grid, nadir view) Gridded pixel brightness temperature for channel S8



- GEO imagers such as LI
- Polar radiometers such as OLCI, 3MI

(1km TIR grid, nadir view) Gridded pixel brightness temperature for channel S8 (K)

Data Min = 202.0, Max = 314.8



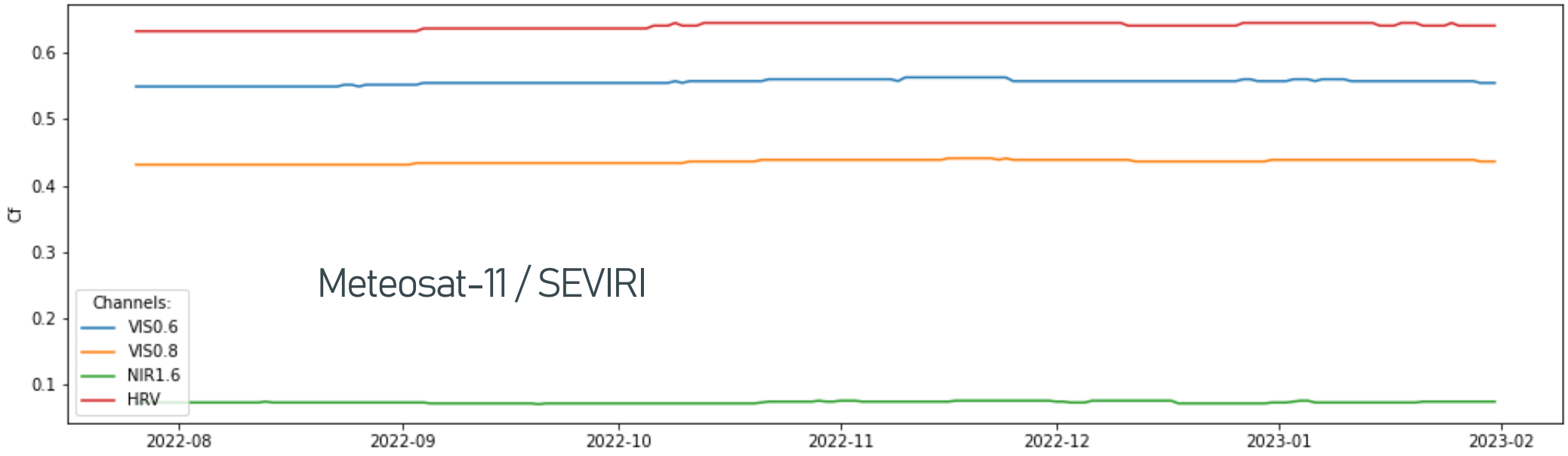
Set-up for MSG/SEVIRI

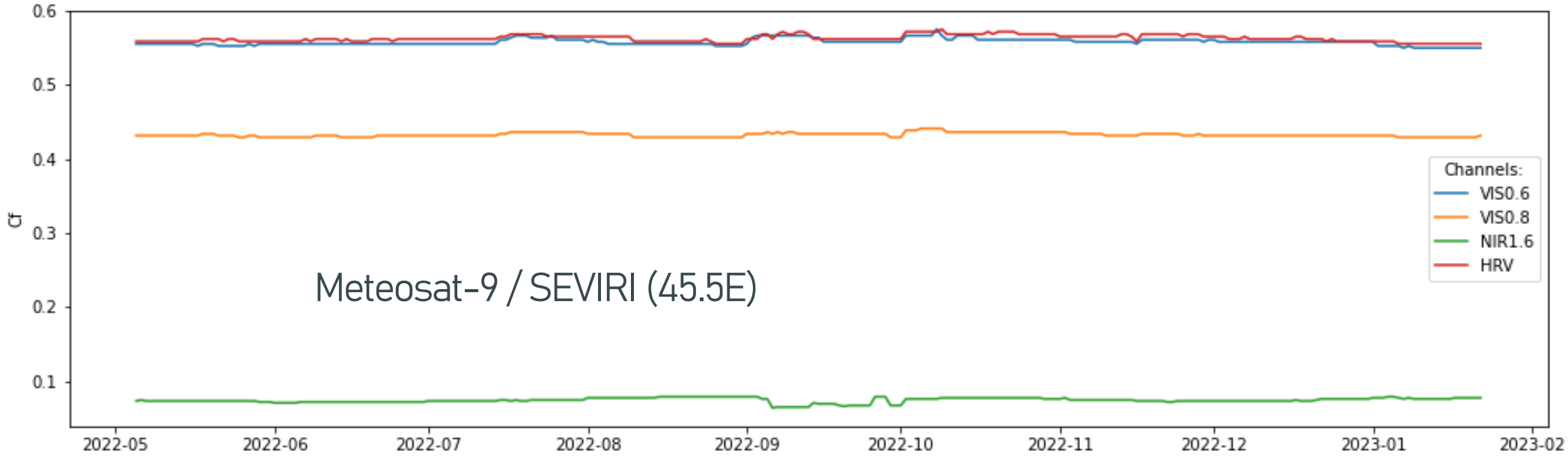
- Reference channels

SEVIRI channel	VIIRS reference band
VIS0.6	M5
VIS0.8	M7
NIR1.6	M10 (only for SBAF – no ref value)
HRV	M5

- Reference radiance: as per the GSICS ATBD (for Lon 45.5E, same as for Lon 41.5E)
- For SWIR, no reference value from VIIRS ➔ based on typical radiance for SEVIRI
- Homogeneity test done on all channels (not only on VIS0.6)

Some preliminary results for SEVIRI





Generating LEO/LEO DCC products

- Some specific aspects need to be considered for LEO sensors:
  - Equatorial crossing time ➔ impact on the availability of convective cells / DCC pixels
  - Number of satellite over passes :
    - Impact on the availability of convective cells / DCC pixels
    - Definition of the accumulation time window to derive a product
  - Possibility to have multiple inter-calibration areas to consolidate the results ➔ GEO areas
- Current status in MICMICS:
  - DCCICS intermediate products + GSICS LEO/LEO products under validation (S3 OLCI/SLSTR)
  - Reference bands for OLCI + SLSTR to be confirmed

Future developments / evolutions

- System:
  - Decommissioning of the current system in favour of MICMICS ➔ Current demo DCC product for SEVIRI VIS0.6 versus MODIS Aqua will be discontinued
- Products:
  - GEO/LEO
    - Activation of the DCCICS workflow for MTG-I1 / FCI + LI + commissioning activities
    - Reprocessing of the MSG SEVIRI data to derive consistent time series over the MSG life time
  - LEO/LEO
    - Finalise the current validation activity
    - Reprocessing of the S3 OLCI + SLSTR data to derive consistent time series over the S3 life time
    - Activation of the DCCICS workflow for Metop/AVHRR
    - Prepare EPS-SG METimage / 3MI
  - GPPA: plan to enter the GPPA with new (enhanced) products.

Thank you!

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