CAMS27 update

Bavo Langerock
BIRA-IASB

- **Project setup**
- **Shared tools**

CAMS2-27 bis: project setup

- Funding for providing reference measurement data more rapidly to NDACC (instead of yearly -> monthly/weekly)

- Service contract (no research) with ECMWF (& ESA) ~~in~~ in the framework of Copernicus

- Only for targeted NDACC data products: for FTIR -> CO, methane, ozone, formaldehyde

  other instruments: LIDAR, MWR, UVVIS

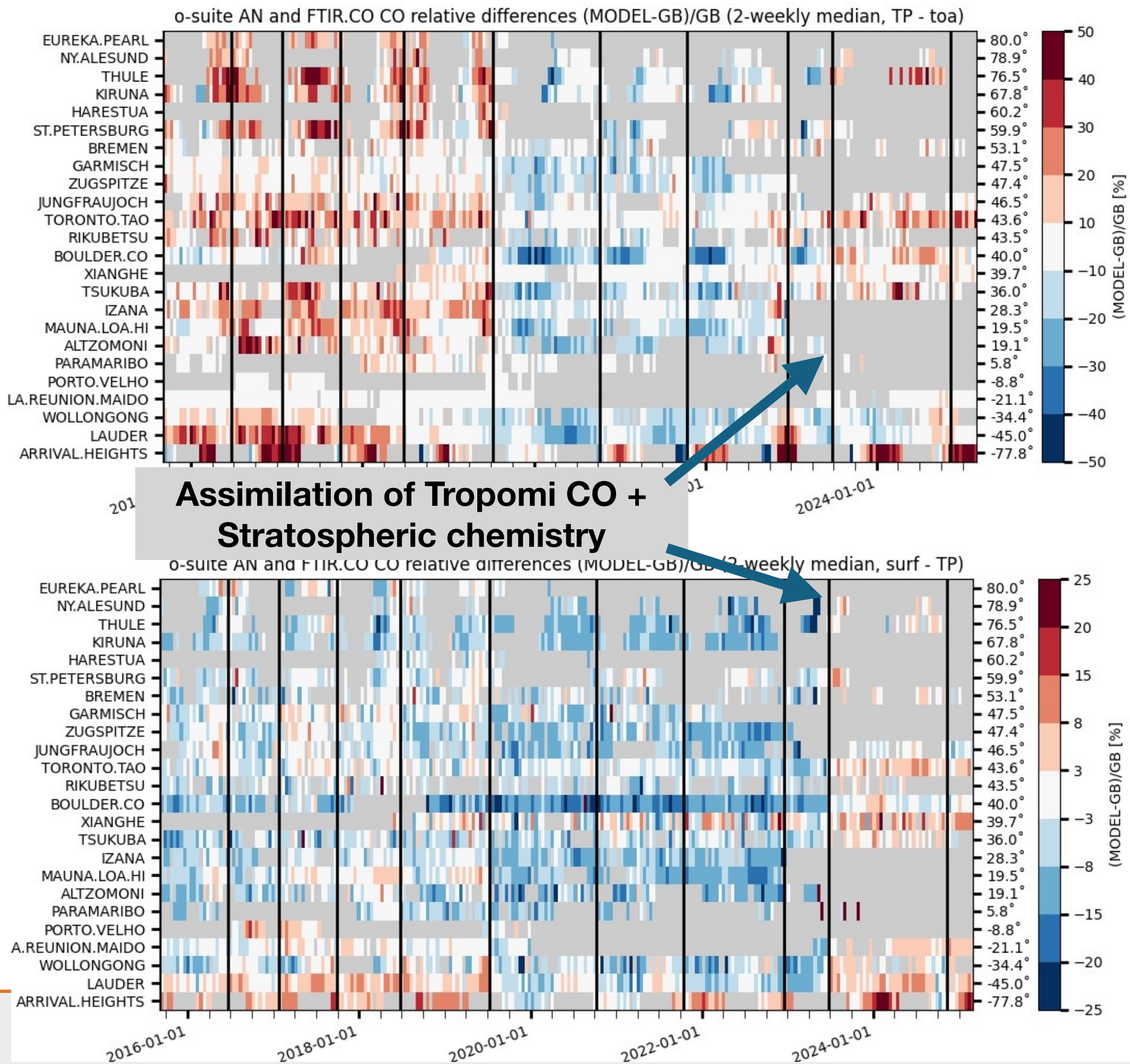
- Targeted data are monitored upon submission to NDACC:
  - only quality approved data are accepted
  - records submission date

- May 2026 - June 2028

CAMS2-27: data usage in CAMS

- https://atmosphere.copernicus.eu/eqa-reports-global-services
  > quarterly update for operational model experiments
  > quarterly update for reanalysis
  > periodic evaluation of upgrades to the operational runs
  > periodic on demand evaluation of ECMWF experiments (GHG models)

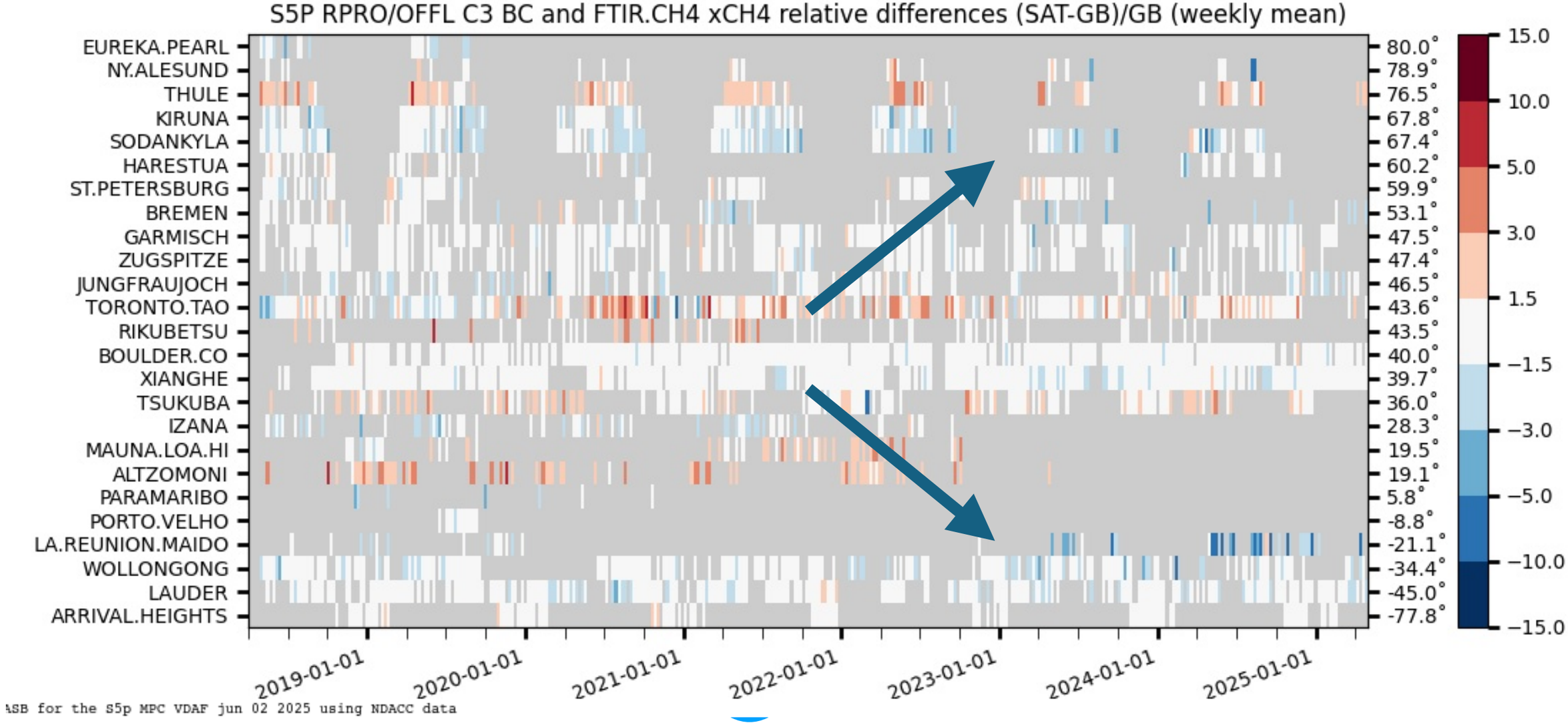
  https://atmosphere.copernicus.eu/provision-ndacc-observations


o-suite AN and FTIR.CO CO relative differences (MODEL-GB)/GB (2-weekly median, TP - toa)
EUREKA.PEARL
NY.ALESUND
THULE
KIRUNA
HARESTUA
ST.PETERSBURG
BREMEN
GARMISCH
ZUGSPITZE
JUNGFRAUJOCH
TORONTO.TAO
RIKUBETSU
BOULDER.CO
XIANGHE
TSUKUBA
IZANA
MAUNA.LOA.HI
ALTZOMONI
PARAMARIBO
PORTO.VELHO
LA.REUNION.MAIDO
WOLLONGONG
LAUDER
ARRIVAL.HEIGHTS
80.0° 78.9° 76.5° 67.8° 60.2° 59.9° 53.1° 47.5° 47.4° 46.5° 43.6° 43.5° 40.0° 39.7° 36.0° 28.3° 19.5° 19.1° 5.8° -8.8° -21.1° -34.4° -45.0° -77.8°
50 40 30 20 10 −10 −20 −30 −40 −50
(MODEL-GB)/GB [%]
2024-01-01
Assimilation of Tropomi CO +
Stratospheric chemistry
o-suite AN and FTIR.CO CO relative differences (MODEL-GB)/GB (2-weekly median, surf - TP)
EUREKA.PEARL
NY.ALESUND
THULE
KIRUNA
HARESTUA
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BREMEN
GARMISCH
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80.0° 78.9° 76.5° 67.8° 60.2° 59.9° 53.1° 47.5° 47.4° 46.5° 43.6° 43.5° 40.0° 39.7° 36.0° 28.3° 19.5° 19.1° 5.8° -8.8° -21.1° -34.4° -45.0° -77.8°
25 20 15 8 3 −3 −8 −15 −20 −25
(MODEL-GB)/GB [%]
2016-01-01
2018-01-01
2020-01-01
2022-01-01
2024-01-01

CAMS2-27: data usage S5P

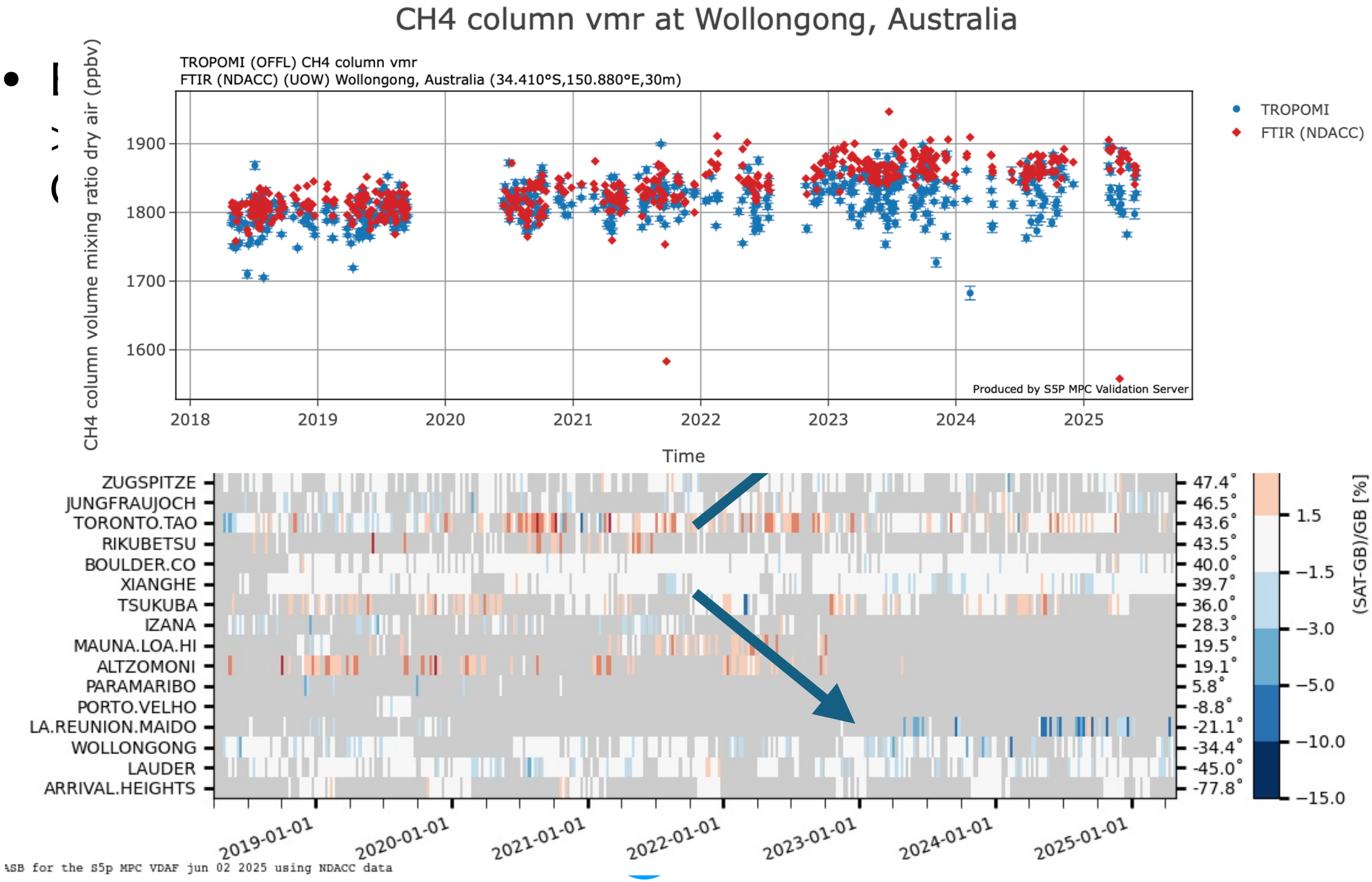
- ESA/ATM-MPC mpc-vdaf.tropomi.eu
  > quarterly update: IRWG used for CO, H2CO and CH4 … (and O3)

S5P CH4 evaluation



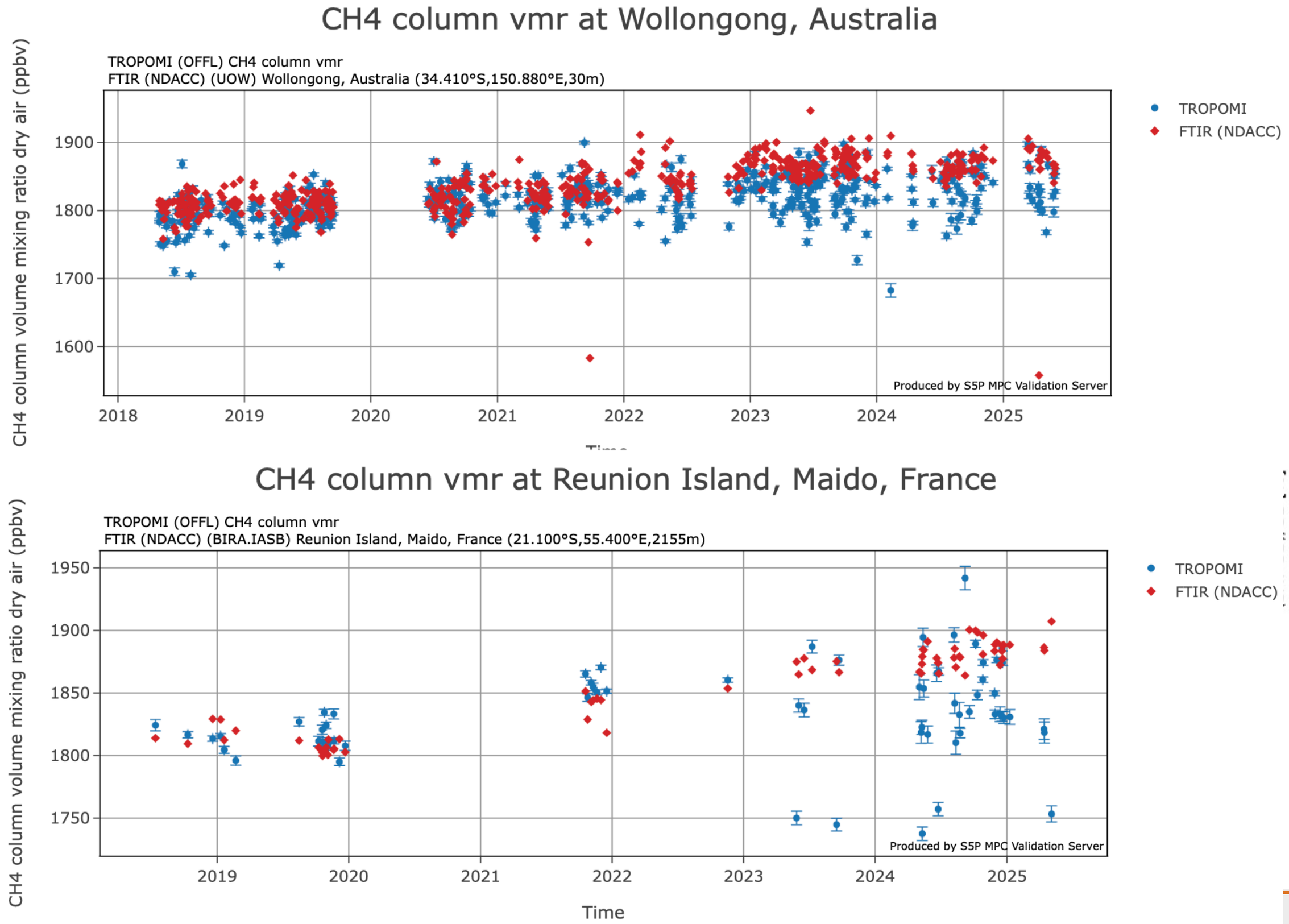
CAMS2-27: data usage S5P

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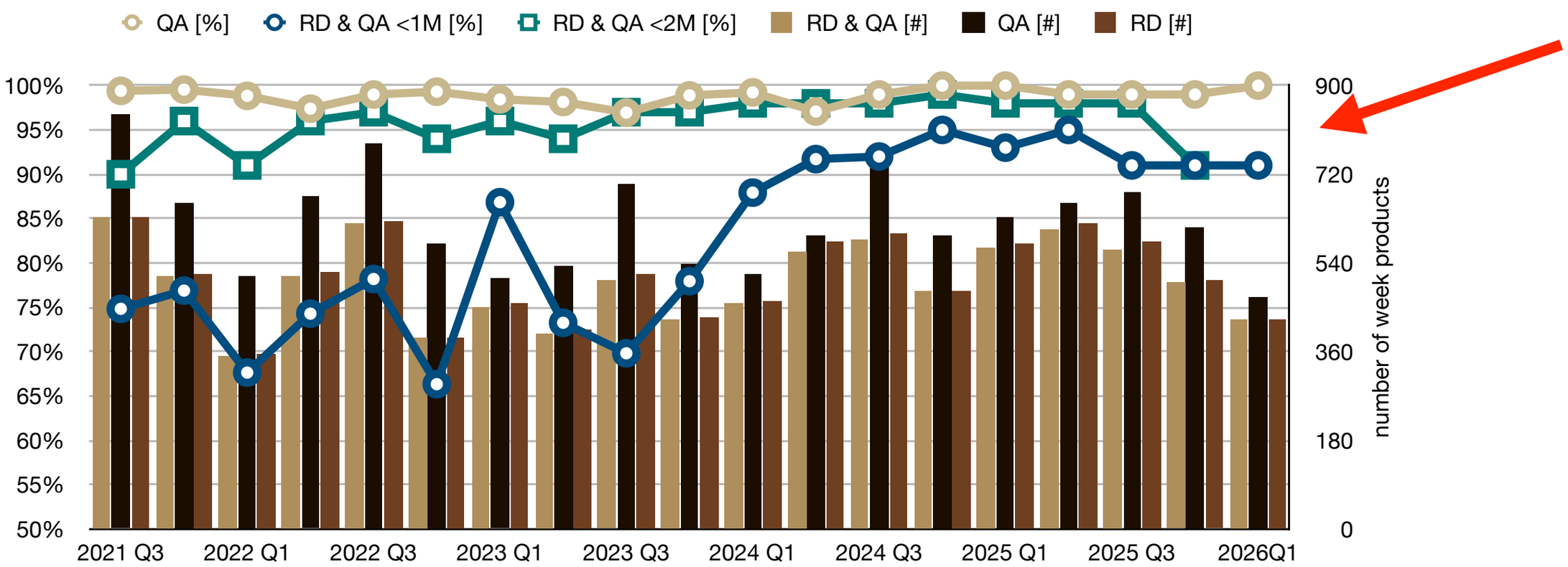


CAMS2-27: data usage S5P

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CAMS2-27: KPI



- Statistics on “weeks with measurements”

- Room for improvement on RD submissions: the target KPI is 95% for RD!
  > submit on a (bi)-weekly basis
  (> submit every month the recent data in weekly files)

- warning let me know when using extra GEOMS versioning!!

- NDACC methane is becoming increasingly important: both CAMS and S5P rely on it

- Future missions: CO2M, Sentinel-5, Carbon Mapper, … + GHG dedicated models from ECMWF

  + provides a rapidly available methane reference
  + strato/tropo partial columns
  - uncertainties are (too) high

- Can we improve this product?
  Uncertainties, calibration (WMO), evaluate a central processing product,…

Shared Tools

- CAMS quality checker (complements NDACC QAQC)

```
f=~/Downloads/
groundbased_ftir.o3_unam001_altzomoni_20121026t204833z_20130323t19
0007z_003.hdf

curl --form testfile=@"${f}" -H "Accept: text/html" https://
api.aeronomie.be/api/runners/geoms_qaqc > test.html
```

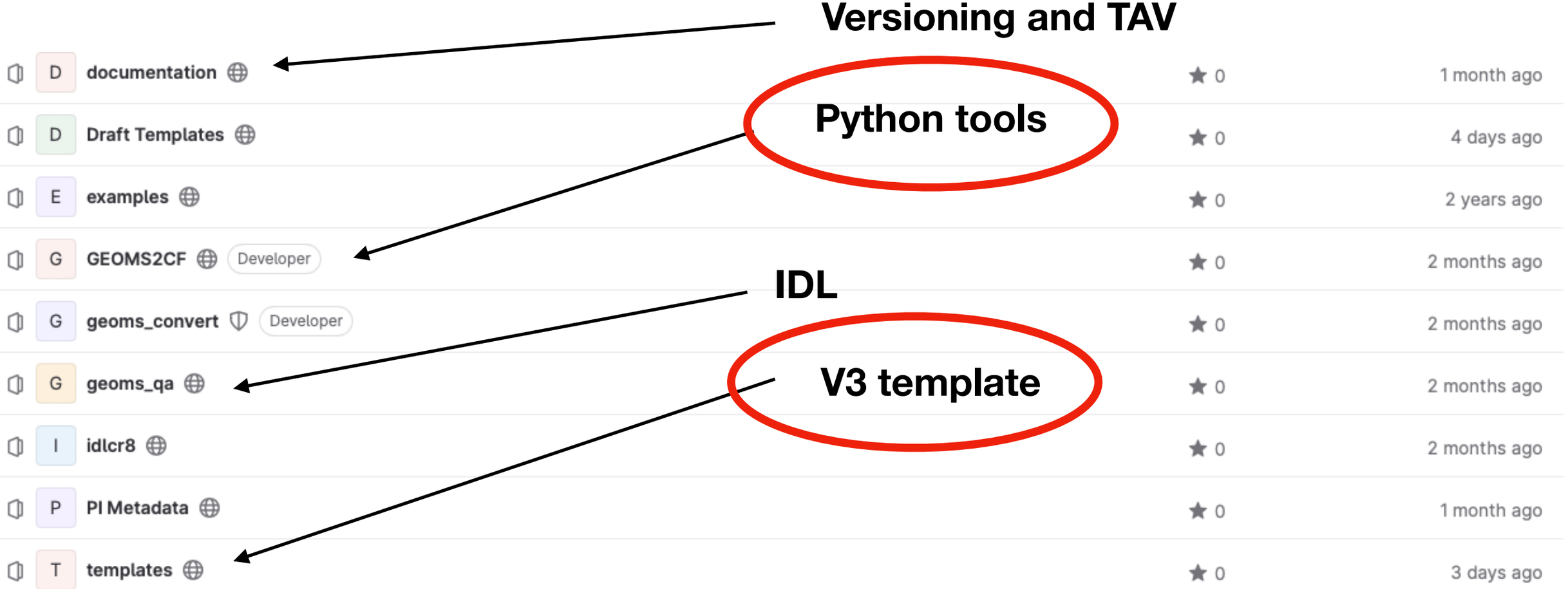
```
import requests

response = requests.post(‘https://api.aeronomie.be/api/runners/
geoms_qaqc', headers={'Accept': 'text/html'}, files={'testfile':
open('f', ‘rb')})
```

Shared Tools

- NDACC QAQC upload is hosted at EVDC: https://geoms-tool.nilu.no/

- Other GEOMS tools, hosted at NILU for EVDC ESA: https://git.nilu.no/geoms



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Tools partly developed in the framework of ACTRIS central processing facility for IRWG: O3, H2CO, NO2, C2H6, NH3 (see presentation in Spa 2023)

- `geomsma.py`: **manipulates attributes**
- `geoms_h5_to_h4.py`: **convert hdf5 to hdf4**
- `geomsdoi.py`: **DOI creation** starting from GEOMS file
- `geoms2nc.py`: **netCDF-CF creation** starting from GEOMS file
- PRIOR sharing

Prior Sharing

- curl -s https://api.aeronomie.be/api/runners/cp_prior/jungfraujoch/ERA5T.nc4 -O -J

- curl -s --compressed "https://api.aeronomie.be/api/runners/cp_prior/jungfraujoch/ERA5T.nc4.json?H2O,T&time=\"2026-04-01%2008:00\""

- nccopy "http://api.aeronomie.be/api/runners/cp_prior/jungfraujoch/ERA5T.nc4?H2O,T&"$(echo 'time>="2026-01-01"' | jq -Rr @uri)"&"$(echo 'time<"2026-02-01"' | jq -Rr @uri) era5t_202601.nc4

- Python / curl / json : take a spectrum get the closest/interpolated ZPT