

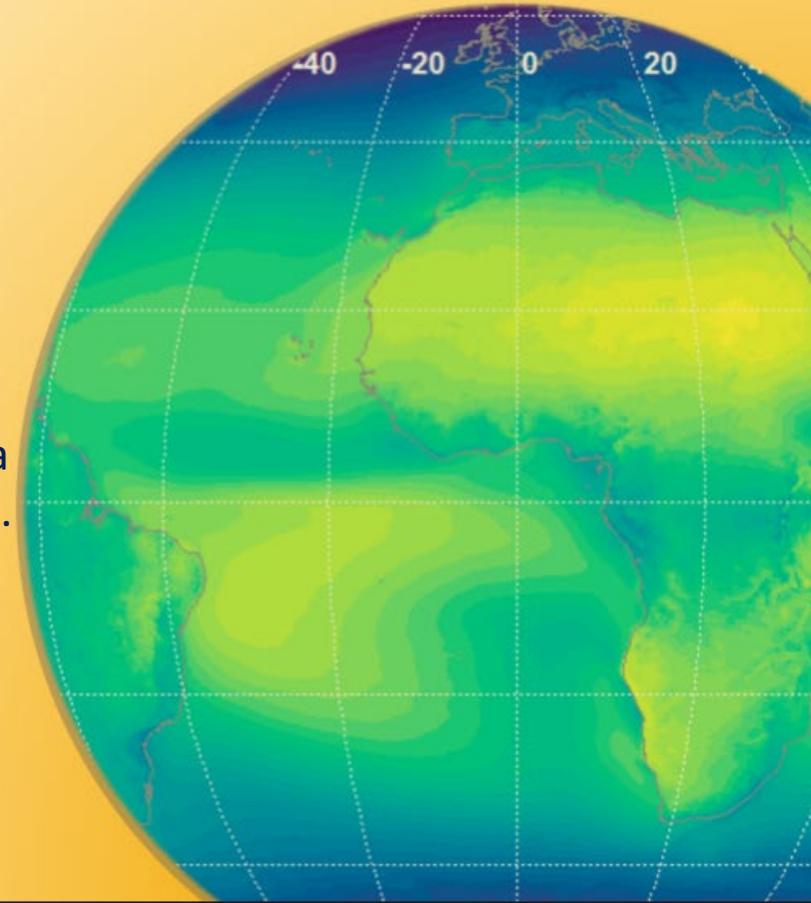
The session will start at 12 UTC

## SARAH – A Climate Data Record on Surface Solar Radiation



If you have **technical issues**, please send a message in the **zoom chat** box to **Support**.

For **Q&A**: go to Slido.com – event code:  
**#EUMSC40**



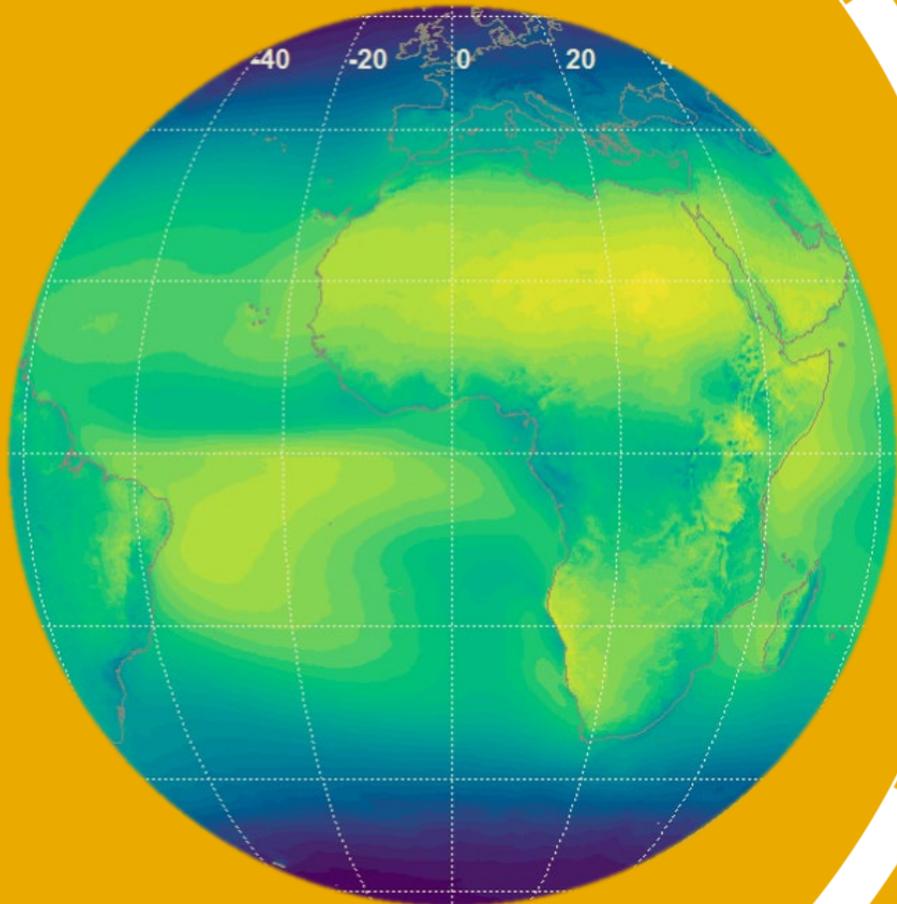


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All **material** will be shared after the course on course page:

<https://training.eumetsat.int/course/view.php?id=484>



## **Welcome and Introduction**

(Christine Träger-Chatterjee, EUMETSAT)

## **The new version of the SARAH data record**

(Uwe Pfeifroth, CM SAF/DWD)

Q&A

## **Ordering Data from CM SAF**

(Steffen Kothe, CM SAF/DWD)

Q&A

## **Using the data – CM SAF R Toolbox**

(Steffen Kothe, CM SAF/DWD)

Q&A

## **Using the data – Jupyter Notebooks**

(Antonio Vecoli, EUMETSAT/MEE0)

Q&A

## **Wrap up and closing (14:00 UTC)**



## Tasks

- Develop, maintain, exploit European systems of meteorological satellites, taking into account as far as possible the recommendations of WMO.
- Contribute to operational climate monitoring and the detection of global climatic changes.



# Current EUMETSAT satellites

## SENTINEL-3A & -3B (98.7° incl.)

Low Earth, sun-synchronous orbit  
Copernicus satellites delivering marine data services from 814km altitude

## JASON-3 (63° incl.)

Low Earth, non-synchronous orbit  
Copernicus ocean surface topography mission (shared with CNES, NOAA, NASA and Copernicus)

## Sentinel-6 Michael Freilich (66° incl.)

Low Earth, non-synchronous orbit  
Copernicus ocean surface topography mission (shared with NASA, NOAA, ESA and Copernicus with support from CNES)



## METEOSAT-10, -11

Geostationary orbit  
Meteosat Second Generation

### Two-satellite system

Full disc imagery mission (15 mins)  
(Meteosat-11 (0°))  
Rapid scan service over Europe (5 mins)  
(Meteosat-10 (9.5° E))

## METEOSAT-9 (45.5° E)

Geostationary orbit  
Meteosat Second Generation  
providing Indian Ocean data coverage

## METOP-B & -C (98.7° incl.)

Low Earth, sun-synchronous orbit  
EUMETSAT Polar System (EPS)/  
Initial Joint Polar System

## MTG-11

Geostationary orbit  
Meteosat Third Generation imaging mission,  
currently in commissioning phase



- EUMETSAT has a network of different Satellite Application Facilities (SAFs)
- SAFs are dedicated centres of excellence for processing satellite data
  - research, development and operational activities
  - each SAF focusses on specific user communities or application areas



- Each SAF is a consortium of entities from EUMETSAT member states



# Space based Climate Monitoring – Challenges

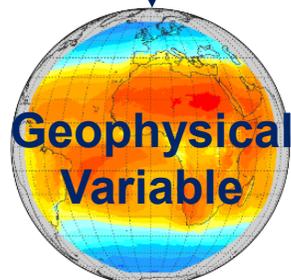
Satellite  
Data



Retrieval

## Near Real Time Data

- generated on a regular basis
- First-order satellite calibration
- *Most recent algorithm and input data (i.e. not homogeneous over time)*

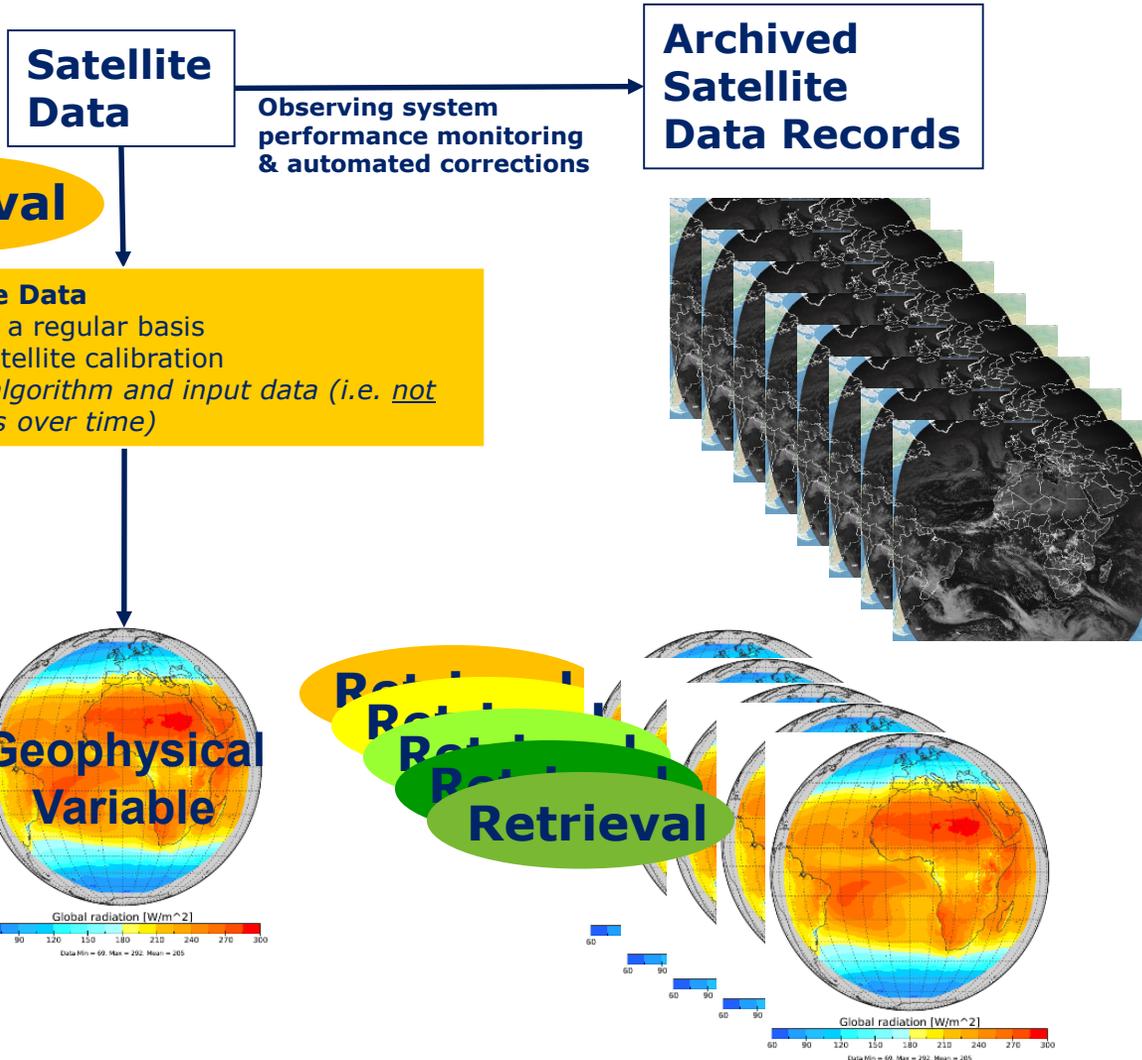


Can be used for  
Near Real Time  
Monitoring  
**Shall not** be used for  
Longer term climate  
variability or trend  
assessment.



## Short and Intermediate Term

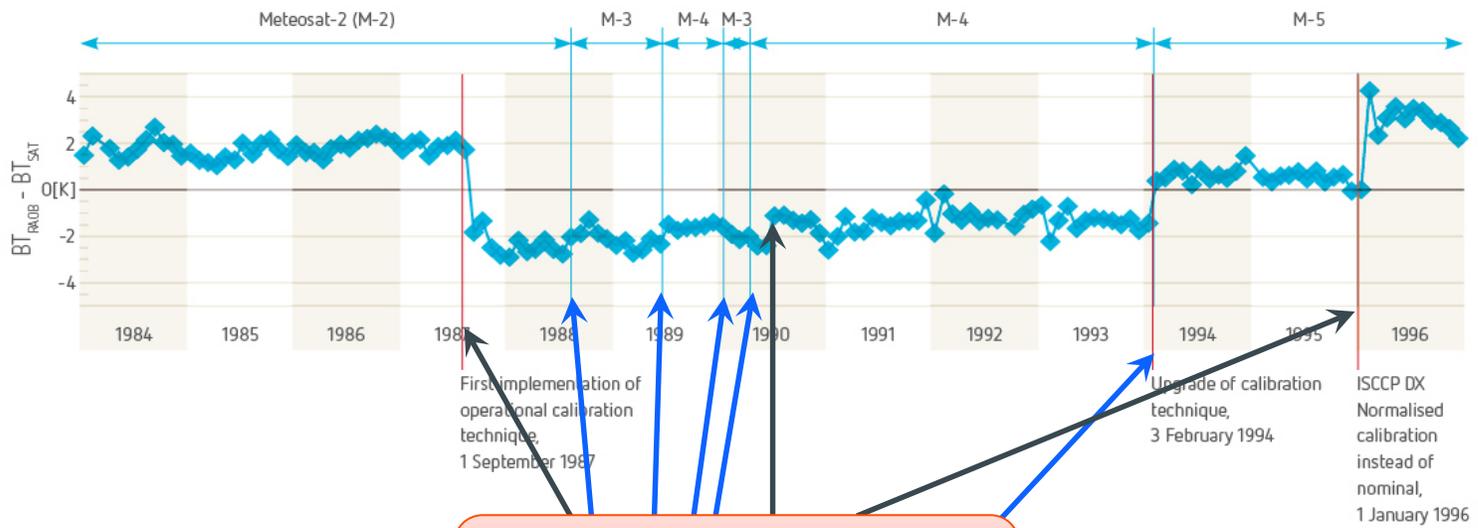
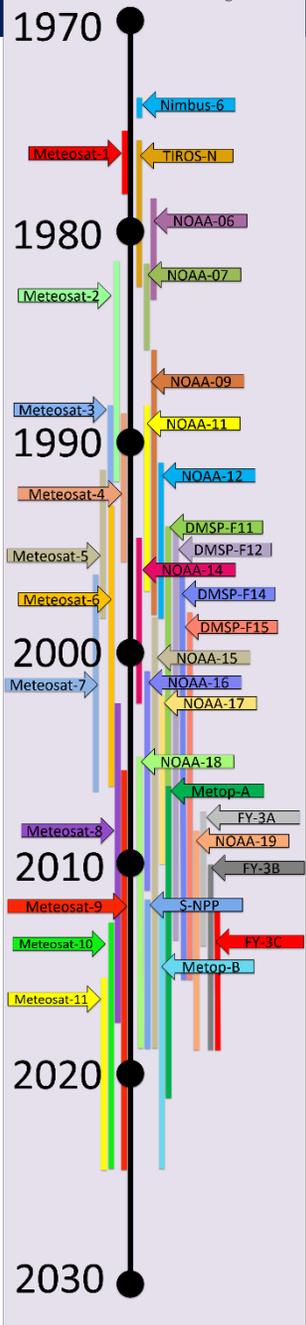
## Longterm



Can be used for Near Real Time Monitoring  
 Shall **not** be used for Longer term climate variability or trend assessment.



# Space based Climate Monitoring - Challenges



**Calibration changes**

**Instrument changes**



# Space based Climate Monitoring – Challenges

## Short and Intermediate Term

## Longterm

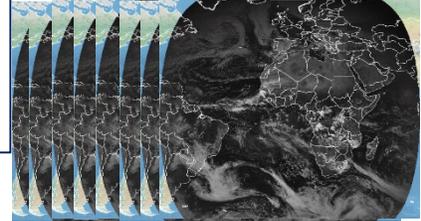
Satellite Data

Observing system performance monitoring & automated corrections

Archived Satellite Data Records

Re-calibration & Inter-calibration

Fundamental Climate Data Records



Retrieval

Retrieval

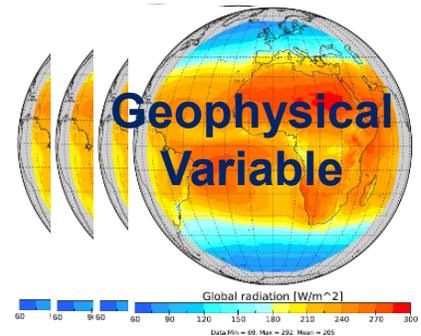
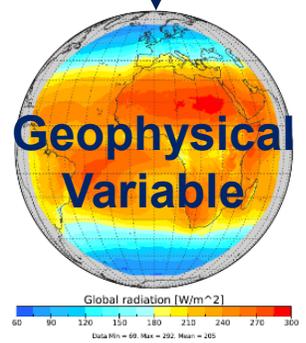
Reprocessing

- Near Real Time Data**
- generated on a regular basis
  - First-order satellite calibration
  - *Most recent algorithm and input data (i.e. not homogeneous over time)*

- Climate Data Record**
- Generated on an irregular basis, i.e. every few years
  - Calibrated and homogenized satellite data
  - Algorithm and auxiliary input data homogeneous over time
  - Resulting time series fully applicable for climate monitoring purposes, including trend estimation

Can be used for Near Real Time Monitoring  
 Shall **not** be used for Longer term climate variability or trend assessment.

Suited for longer term climate variability & climate change analysis as other applications.





# Space based Climate Monitoring – Challenges

## Short and Intermediate Term

Satellite Data

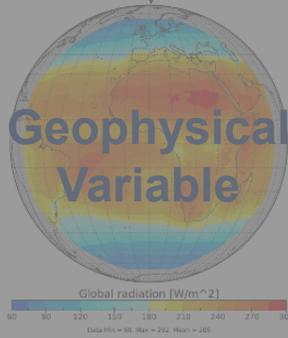
Observing system performance monitoring & automated corrections

Retrieval

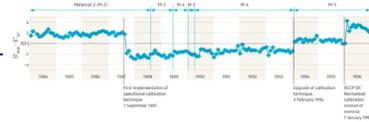
### Near Real Time Data

- generated on a regular basis
- First-order satellite calibration
- *Most recent algorithm and input data (i.e. not homogeneous over time)*

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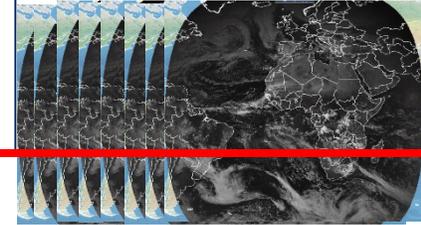
Archived Satellite Data Records



Re-calibration & Inter-calibration

## Longterm

Fundamental Climate Data Records



Retrieval

Reprocessing

### Climate Data Record

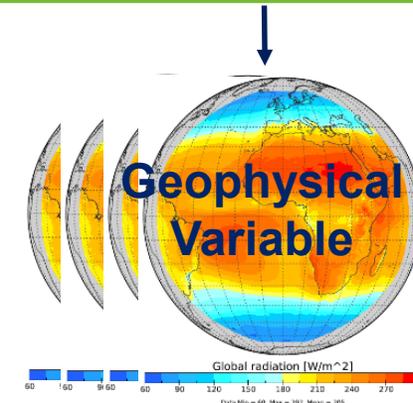
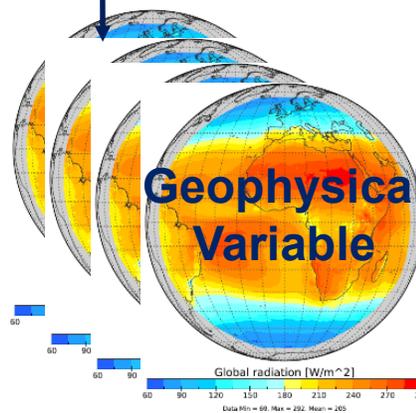
- Generated on an irregular basis, i.e. every few years
- Calibrated and homogenized satellite data
- Algorithm and auxiliary input data homogeneous over time
- Resulting time series fully applicable for climate monitoring purposes, including trend estimation

Suited for longer term climate variability & climate change analysis as other applications.

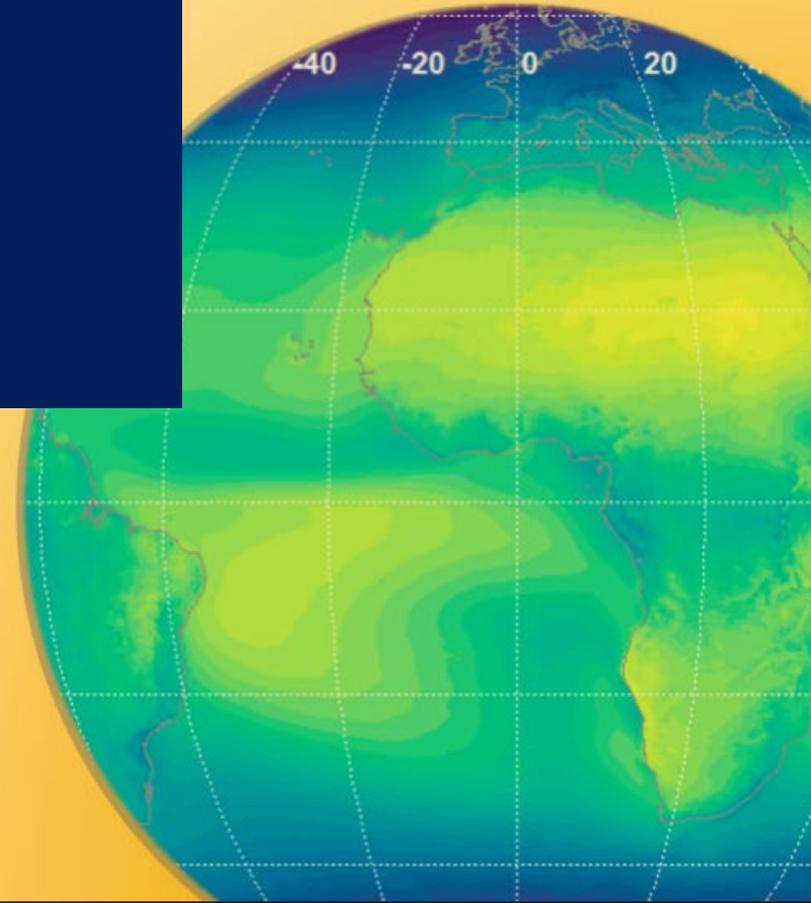
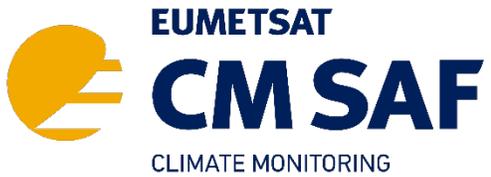
Retrieval

### Interim Climate Data Record

- Generated on a regular basis
- First-order satellite calibration
- Same algorithm and auxiliary input data as for current TCDR
- Fill the gap between end of CDR and present.



# CM SAF Short Course on SARAH – A Climate Data Record on Surface Solar Radiation



**Please give us your feedback:  
slido.com #EUMSC40 (poll)**

**Check out [training.eumetsat.int](https://training.eumetsat.int)  
for more in-depth courses**



- **22 June 2023**      **12 UTC - Data Access Services - How to use the Data Store and Data Tailor through Web User Interface\***
- **04 July 2023**      **12 UTC - Data Access Services - How to use the EUMETSAT Data Access Client (EUMDAC) Command Line Interface\***
- **11 July 2023**      **08 UTC - Wildfire Monitoring with Next-Generation Satellites**
- **14 Sept 2023**      **12 UTC - Data Access Services - How to use the EUMETSAT Data Access Client (EUMDAC) through Command Line Interface and as a Python library\***
- **20 Sept 2023**      **12 UTC - CLARA - A new Climate Data Record on Earth Radiation Budget**
- **18 Oct 2023**      **12 UTC - Data Access Services - How to use the Jupyter Notebooks from the EUMETSAT Data Access Services \***
- **23 Nov 2023**      **12 UTC - Data Access Services - How to use the EUMETSAT Data Access Client (EUMDAC) through Command Line Interface and as a Python library\***

**\* 30 minutes webinar**

<https://training.eumetsat.int/>

→ Events → Short Courses