

MTG LI System commissioning: Off-line Tools (OFTs) development and future steps

Bartolomeo Viticchiè and Taylan Özden¹

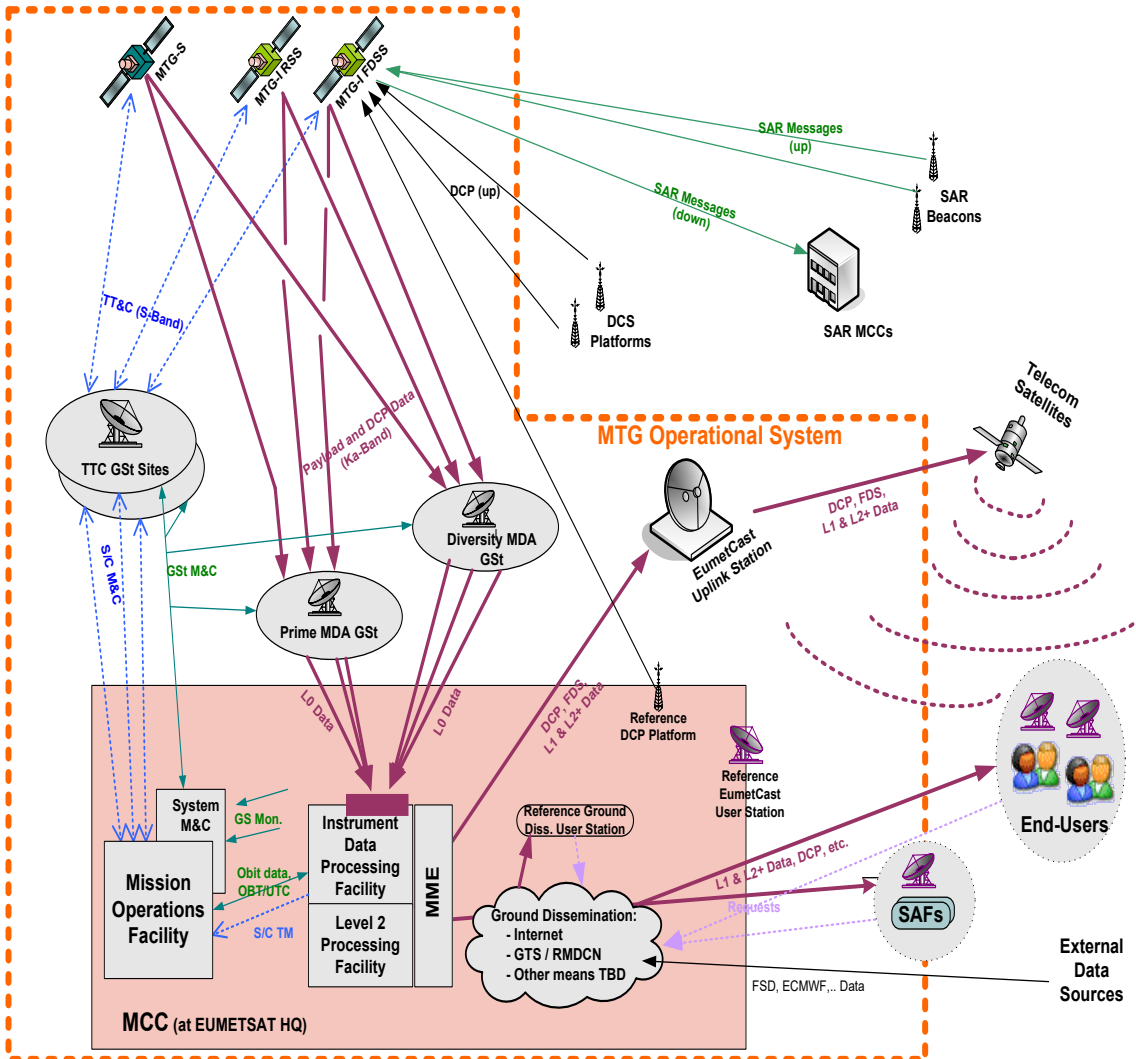
¹Telespazio Vega



Outline

- Introduction
- Off-line Tools for the LI Commissioning and long-term monitoring
- LI-STAR
- Short demo

Introduction



The objective of the commissioning is to ensure that the capabilities of the system are demonstrated in operational configuration under operating conditions.

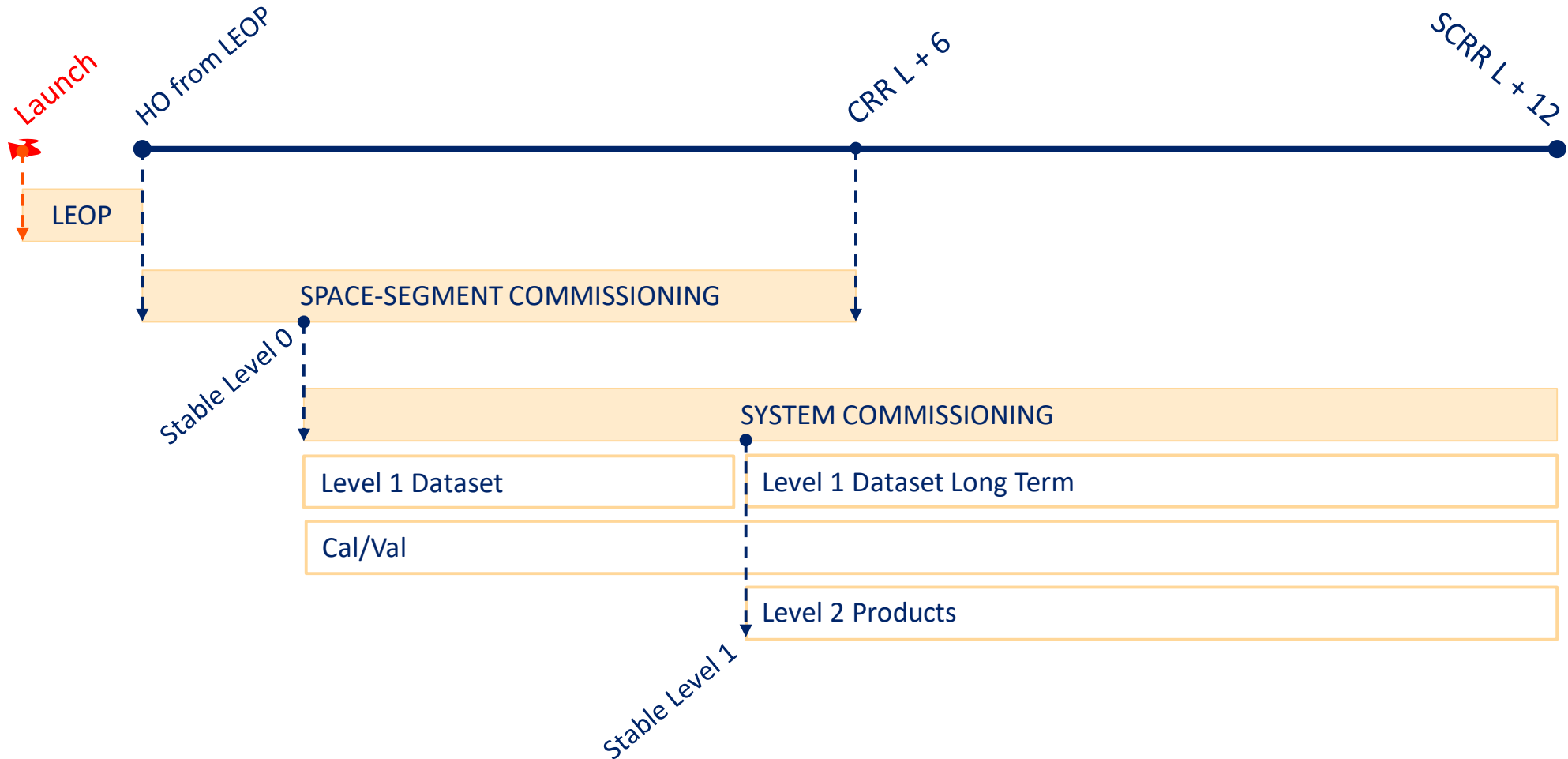
The main goal of the commissioning is to establish sufficient and objective confidence about the readiness of the System allowing the hand-over of the MTG spacecraft operational responsibility, corresponding ground segment and services to the Operations Department (OPS).

Introduction

The duration of the LI commissioning will be of 1 year; of which 6 months will be devoted to the space-segment commissioning

- Space-segment commissioning objectives:
assess the satellite instruments functionality, operability and performance against the space segment requirements.
- System commissioning objectives:
 - I. assess the system readiness to deliver validated Level 1b data and Level 2 products to end-users;
 - II. assess the functionality, operability and performance of the entire system prior to commencing the routine operations.

Introduction



(S)CRR = (System) Commissioning Results Review
LEOP = Launch and Early Operations Phase

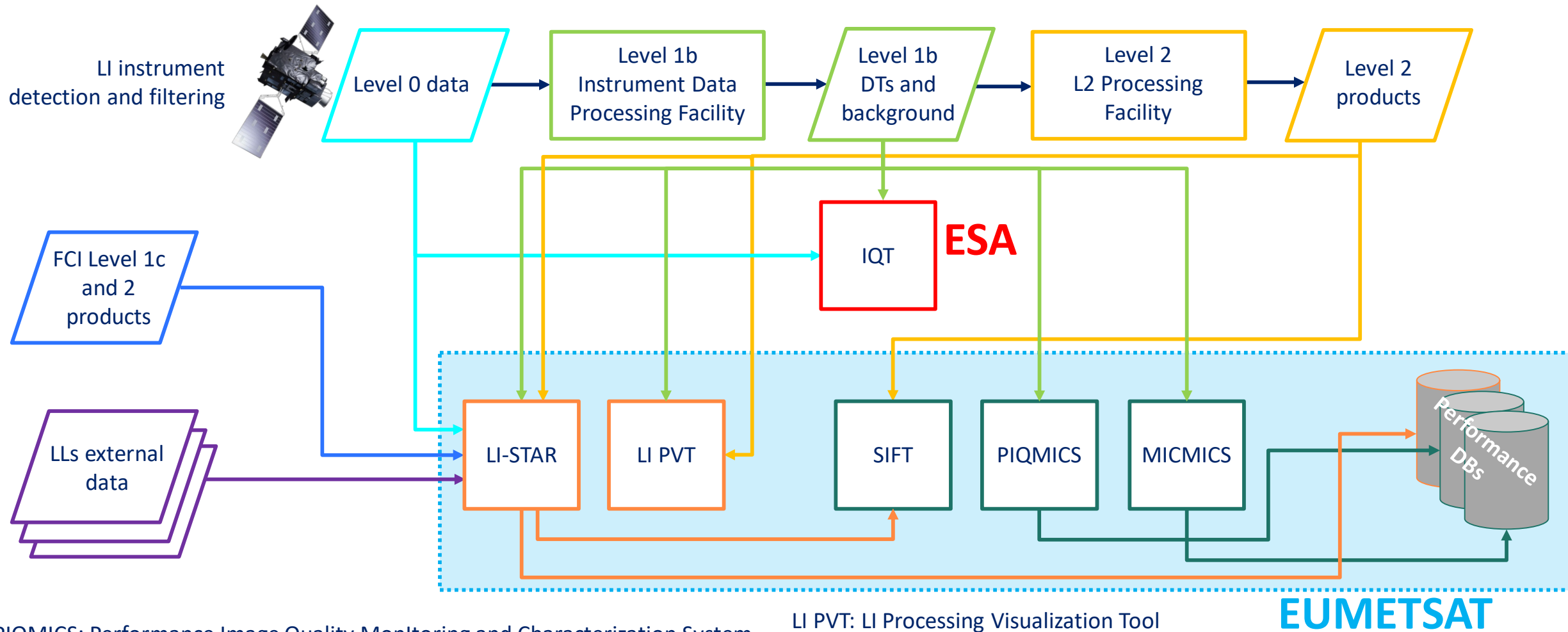
Introduction – status at the last LI MAG #8

- The Remote Sensing and Products (RSP) division has completed the proposal of the different tests aimed at verifying the requirements specified in the System Requirement Document.
- In parallel RSP has specified the so called Offline Tools (OFTs) that will be employed for performing the verification (i.e., the software).
- Currently the “endorsement” of the tests and tools proposed by RSP is on-going: this is a review process within the IFCT; from the endorsement the consolidated LI Commissioning Plan will be produced.
- Bartolomeo Viticchiè is responsible for the preparation of the LI Commissioning Test Specs as well as the implementation of the OFTs

OFTs for the LI commissioning and long-term monitoring

- LI Processing Visualization Tool (LI PVT)
- Satellite Information Familiarization Tool (SIFT)-based visualization tool
- LI STAtistics and Reporting (LI-STAR)
- Performance Image Quality Monitoring and Characterization System (PIQMICS)
- Mission Integrated Calibration Monitoring Inter-Calibration System (MICMICS)

OFTs for the LI commissioning and long-term monitoring



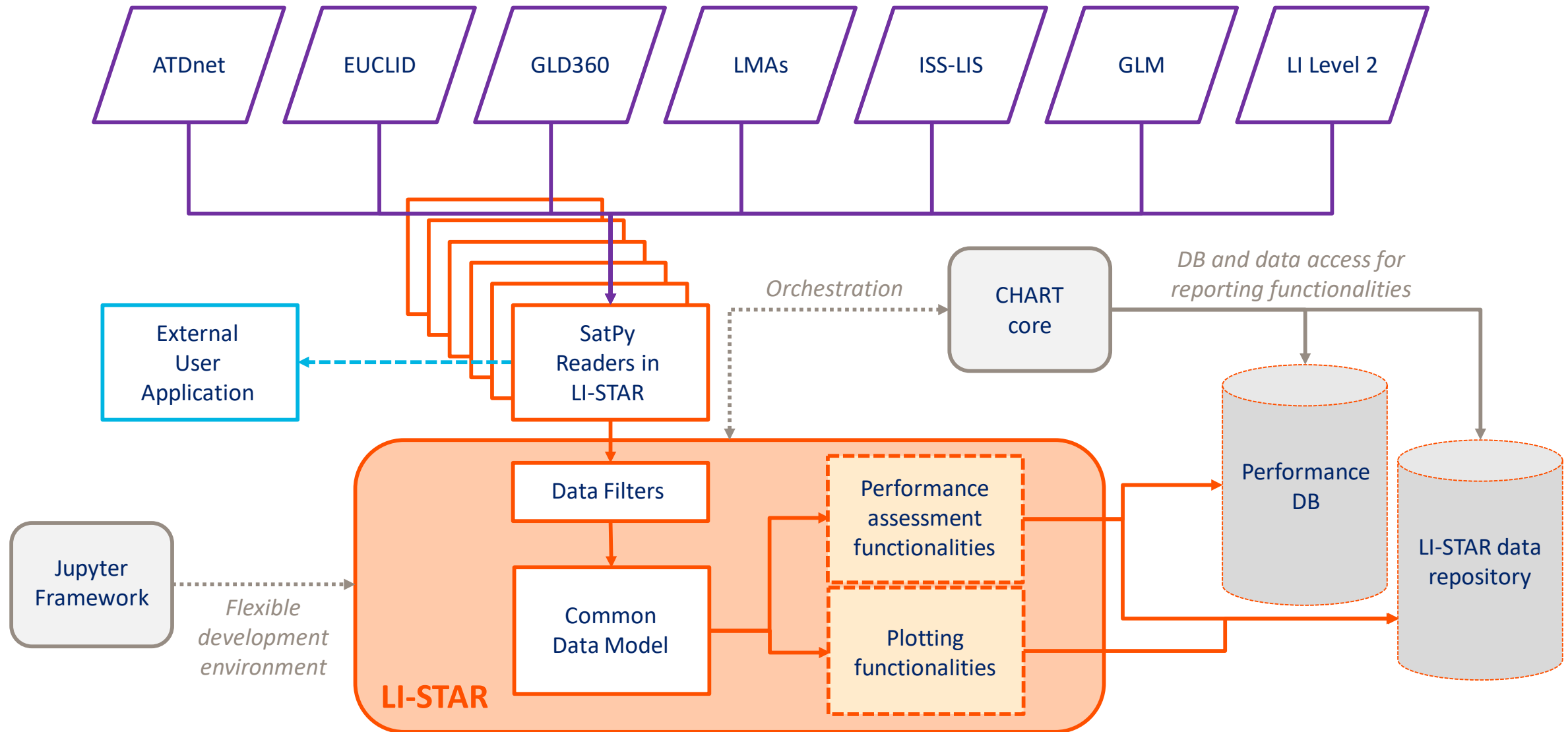
PIQMICS: Performance Image Quality Monitoring and Characterization System
MICMICS: Mission Integrated Calibration Monitoring Inter-Calibration System
SIFT: Satellite Information Familiarization Tool (<https://sift.ssec.wisc.edu/>)

LI PVT: LI Processing Visualization Tool
IQT: Image Quality Tool
LI-STAR: LI STATistics and Reporting
LLs: Lightning Location Systems

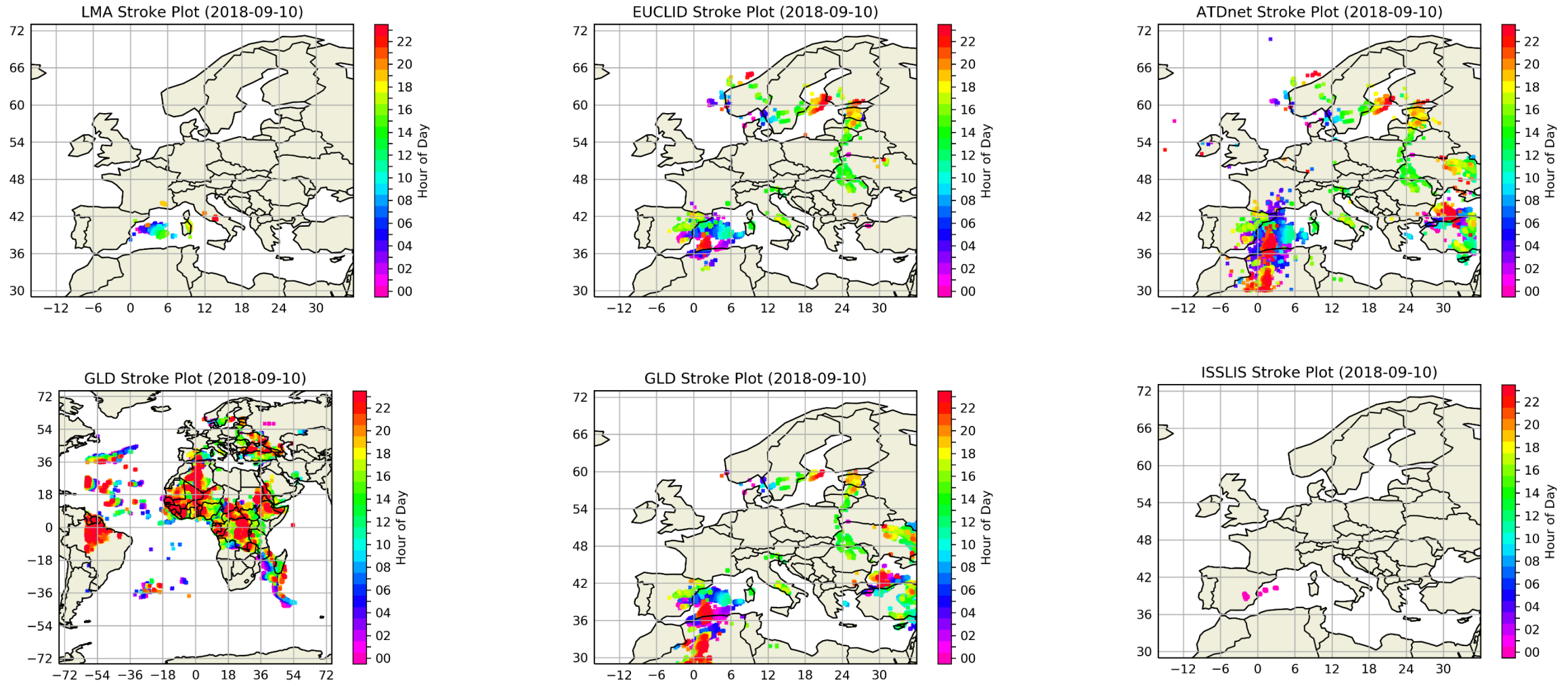
LI-STAR development

- KO in August 2019 with the support of two Telespazio Vega engineers (1 FT overall)
- First five months of the activity devoted to:
 - I. Setting up the LI-STAR framework and data handling concept
 - II. Developing the readers for external data as well as LI Level 2 products
 - III. Start the integration in the CHART-core framework (common framework for OFTs in EUMETSAT)
 - IV. Started the implementation of the lightning detection performance assessment functionalities of LI-STAR

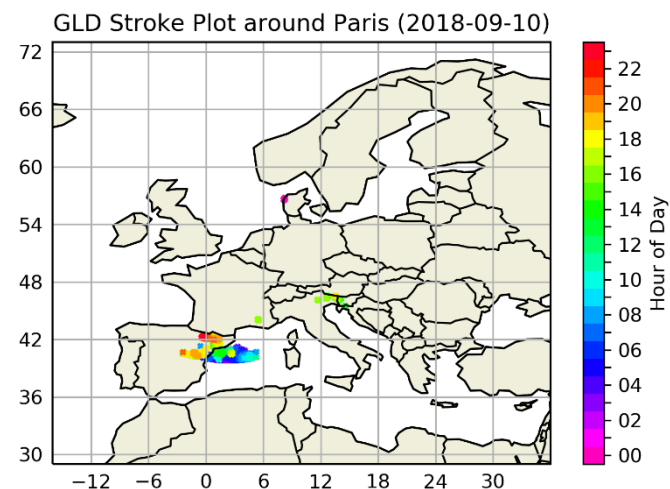
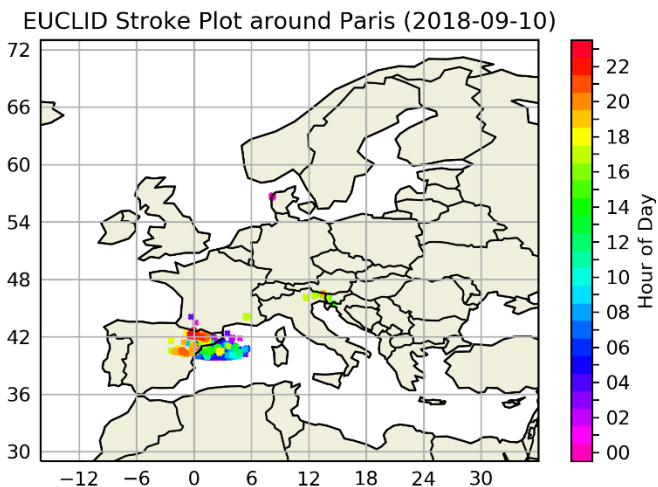
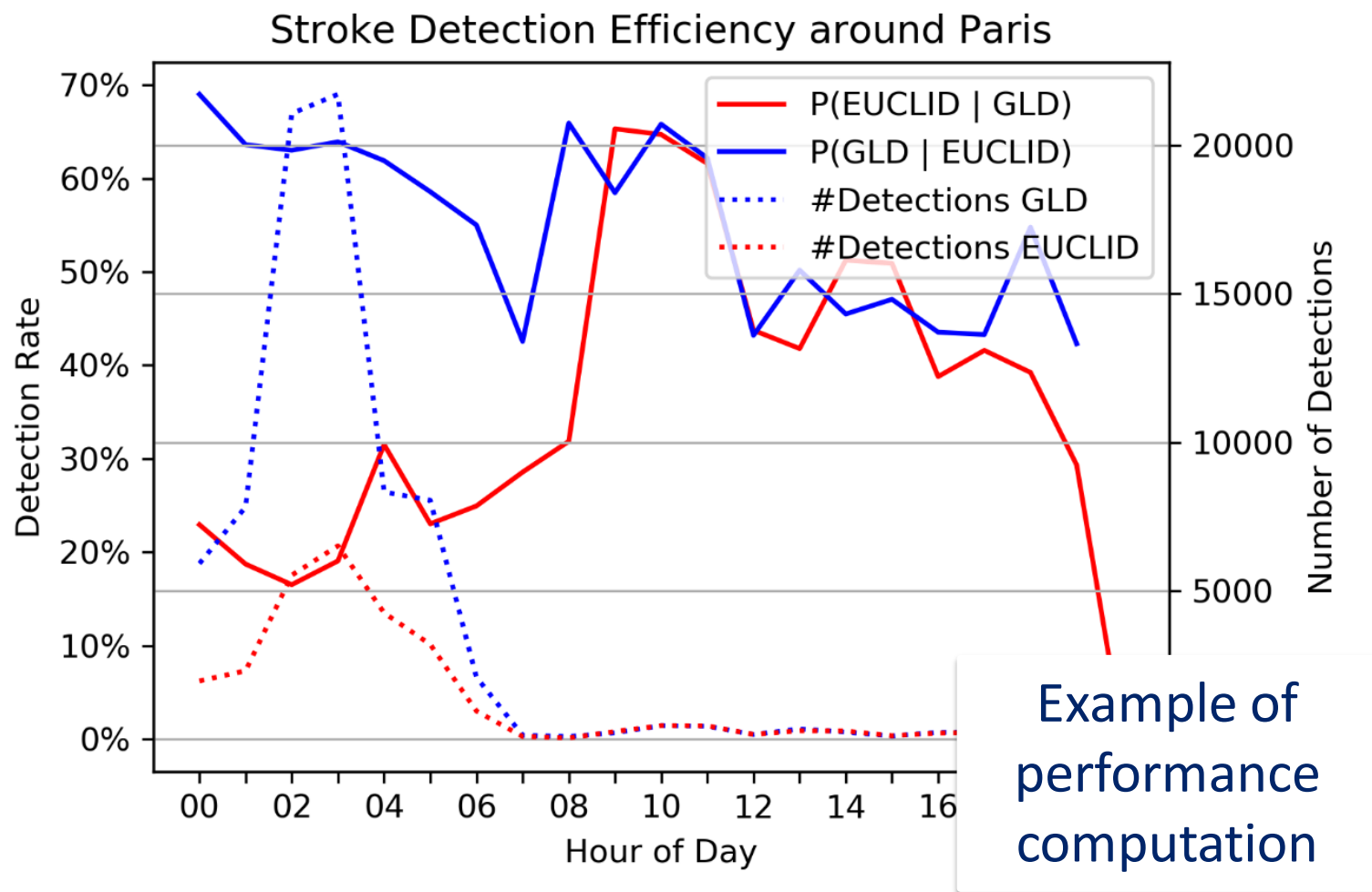
LI-STAR current status



LI-STAR current status

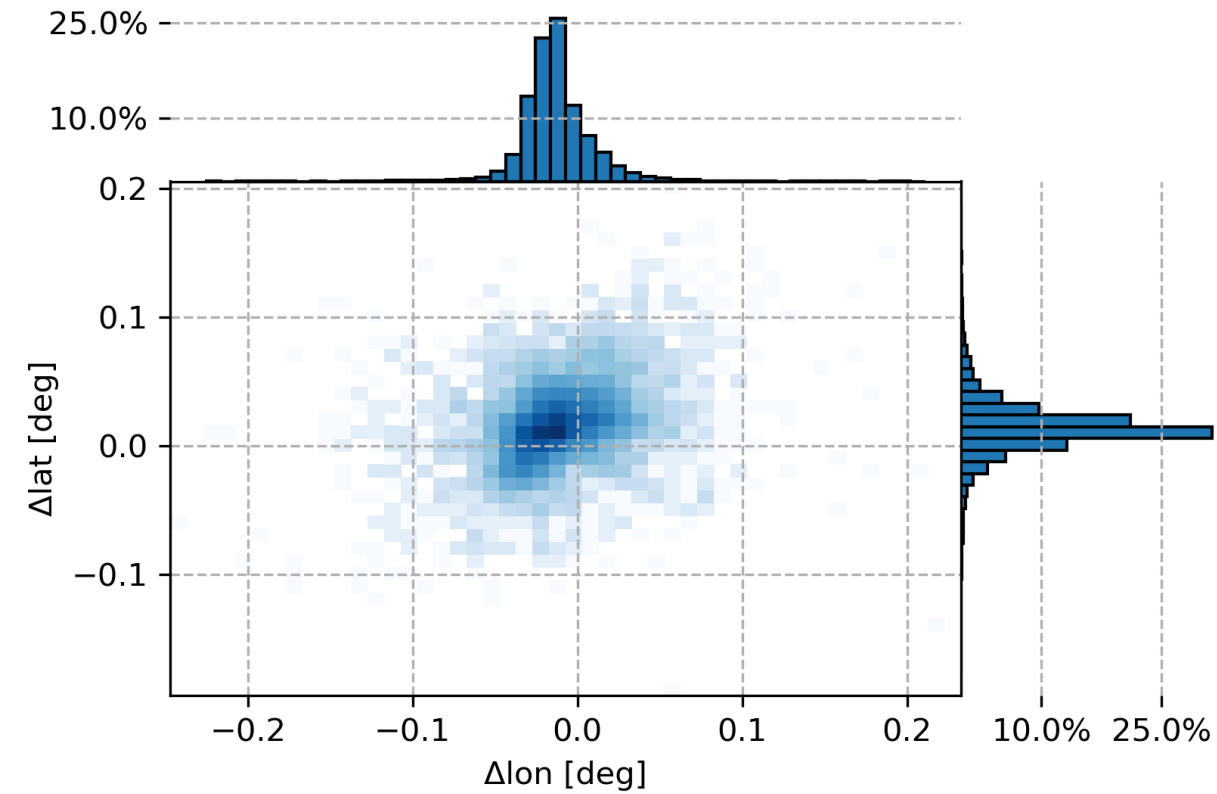


LI-STAR current status

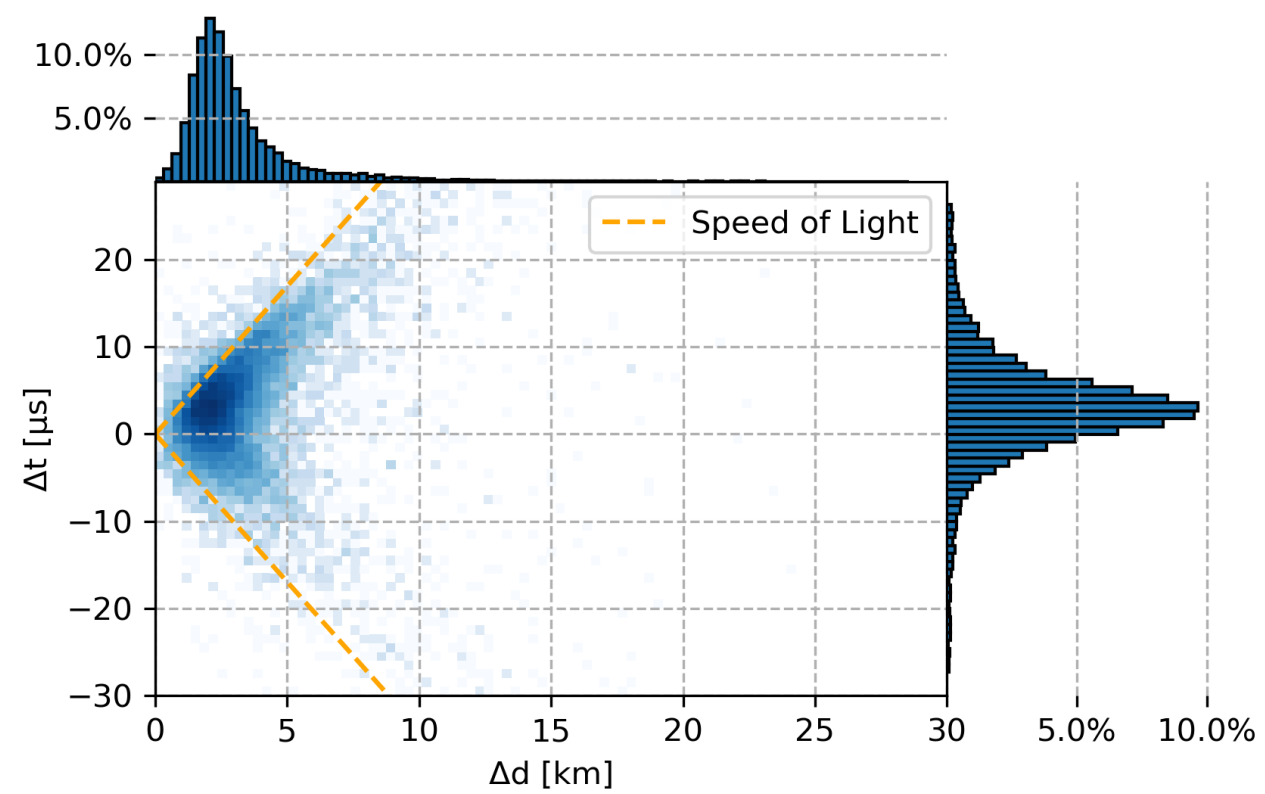


LI-STAR current status

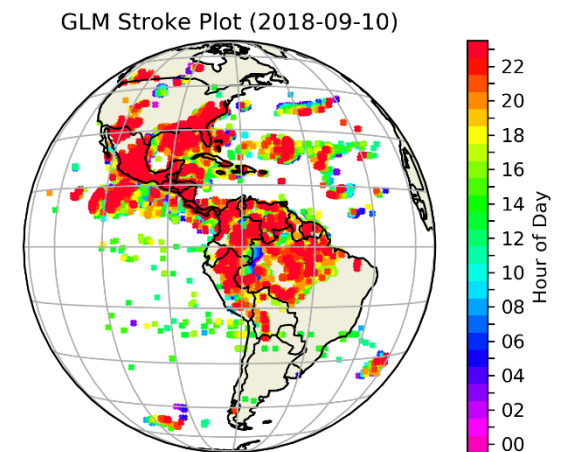
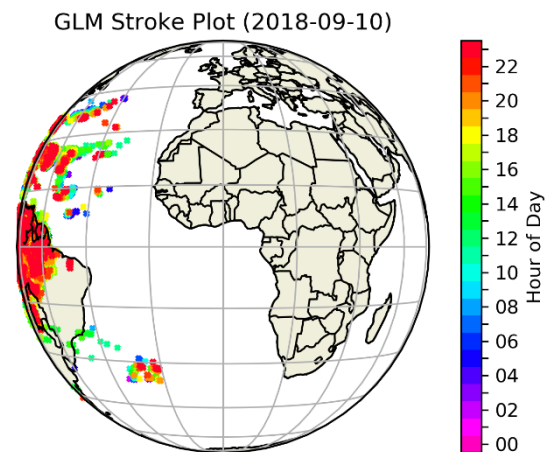
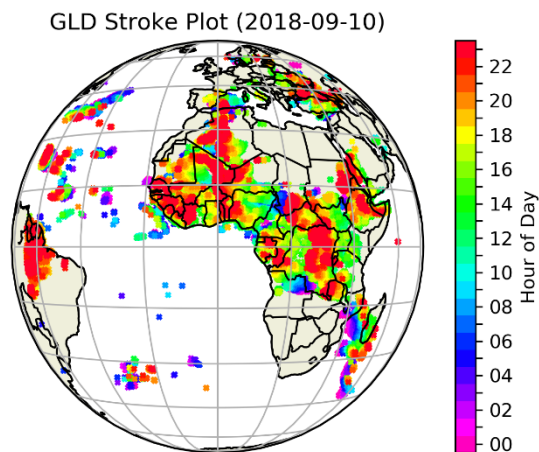
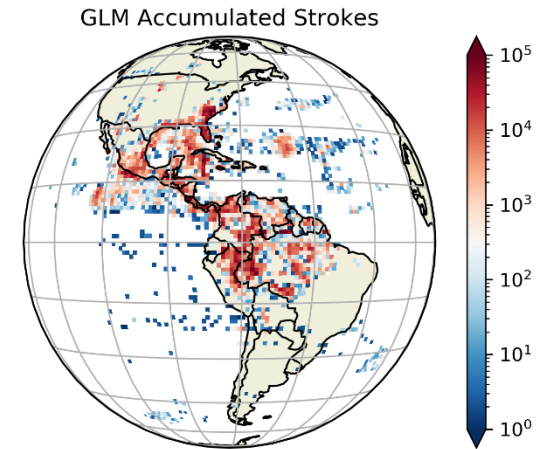
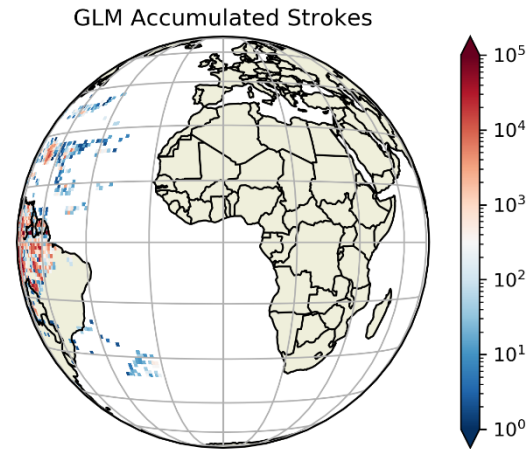
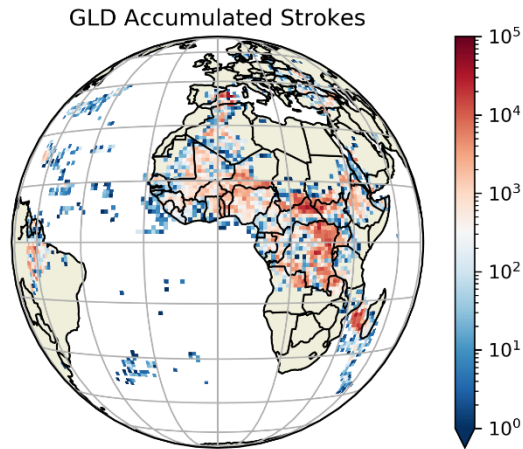
Spatial Accuracy GLD vs. EUCLID around Paris



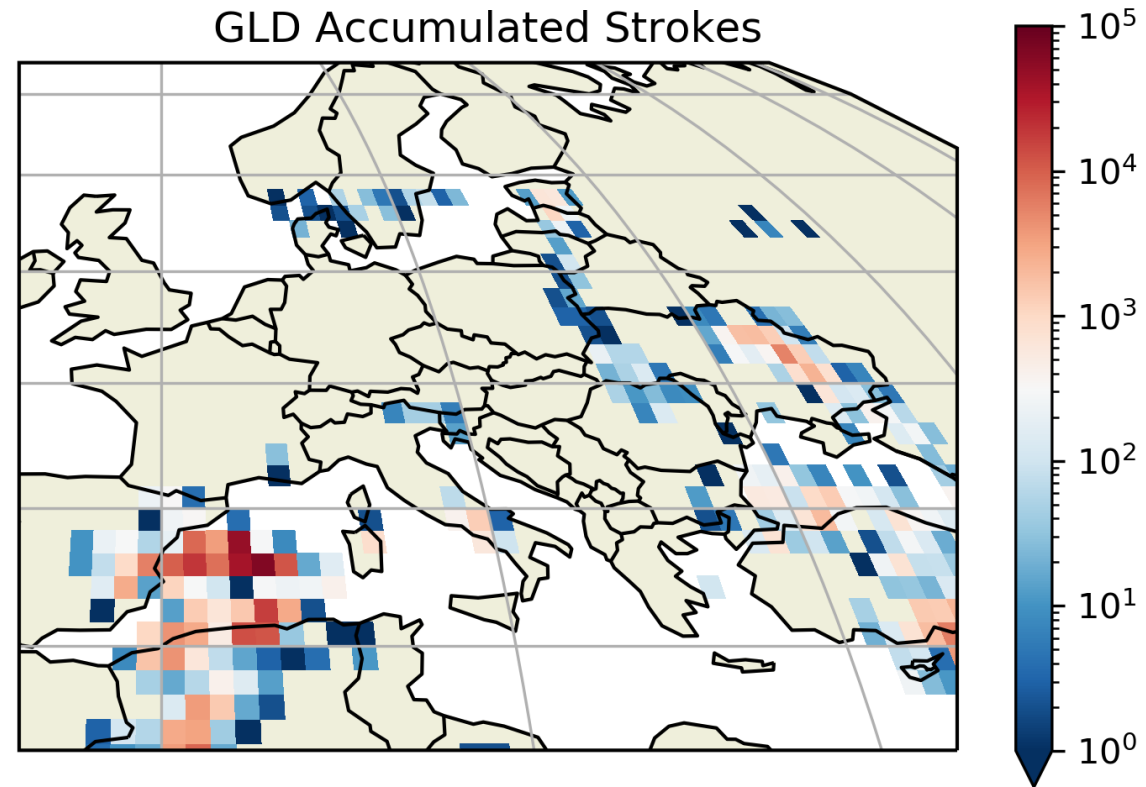
Spatio-Temporal Accuracy GLD vs. EUCLID around Paris



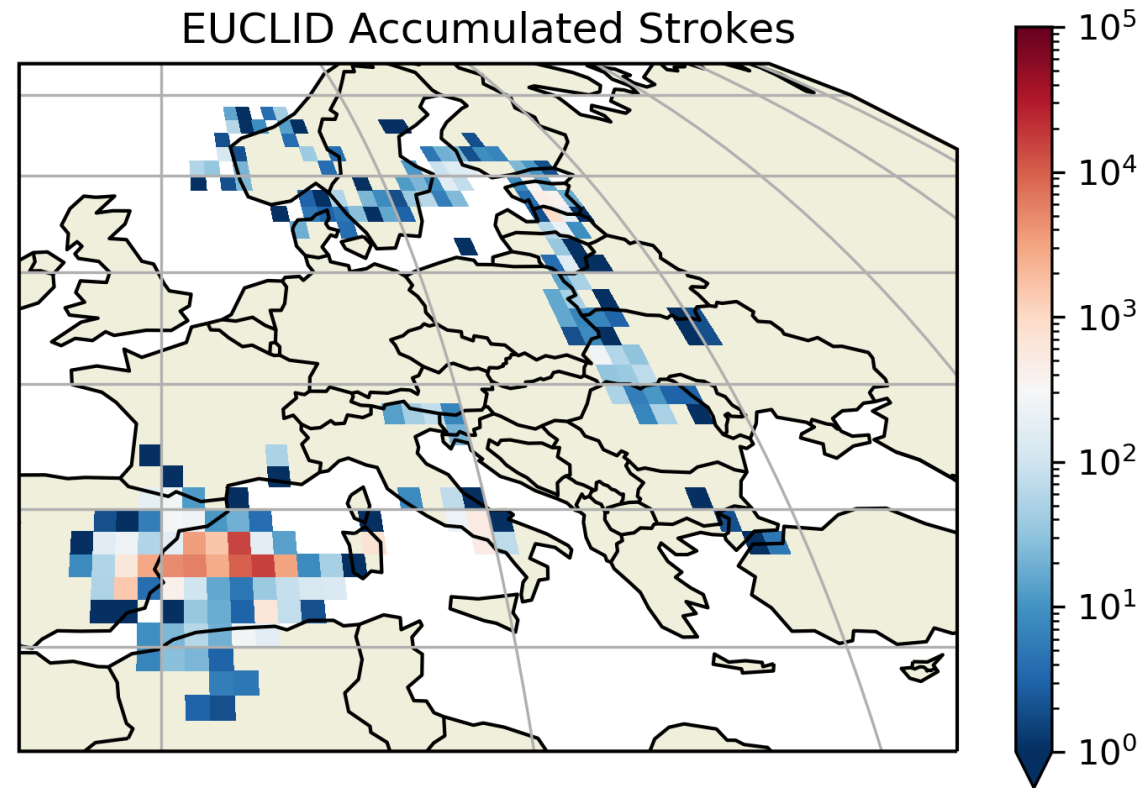
LI-STAR current status



LI-STAR current status



LI-STAR current status



LI-STAR development and verification

1. LI MAG experts should provide EUMETSAT with geographical areas of applicability for the reference datasets
2. Is there the possibility of having a specific time stamp format in the file names (i.e., the one employed in SatPy?)
3. For GLM experts: what is the meaning of the time offset variable in the GLM data?
4. LI MAG experts should communicate to EUMETSAT the frequency with which the data that are provided to EUMETSAT are created (e.g., LMA data are generated every min)

LI-STAR development and verification

EUMETSAT proposal

- Employ one month (at least) of test reference data to test the LI-STAR functionalities to be implemented (encompassing performance computation and plotting/reporting)
- A validation phase could be planned with the live feed of reference data to EUMETSAT in place for at least two reference instruments/networks

With the availability of a large enough set of test data also engineering assessments can be done. Two key assessments to be done are:

1. Processing performance of typical amount of data provided over 24h → HW procurement and/or processing optimization activities
2. Amount of data produced by LI-STAR over 24h → HW procurement
3. Processing performance of large datasets, e.g., in occasion of re-processing campaigns → HW procurement and/or processing optimization activities