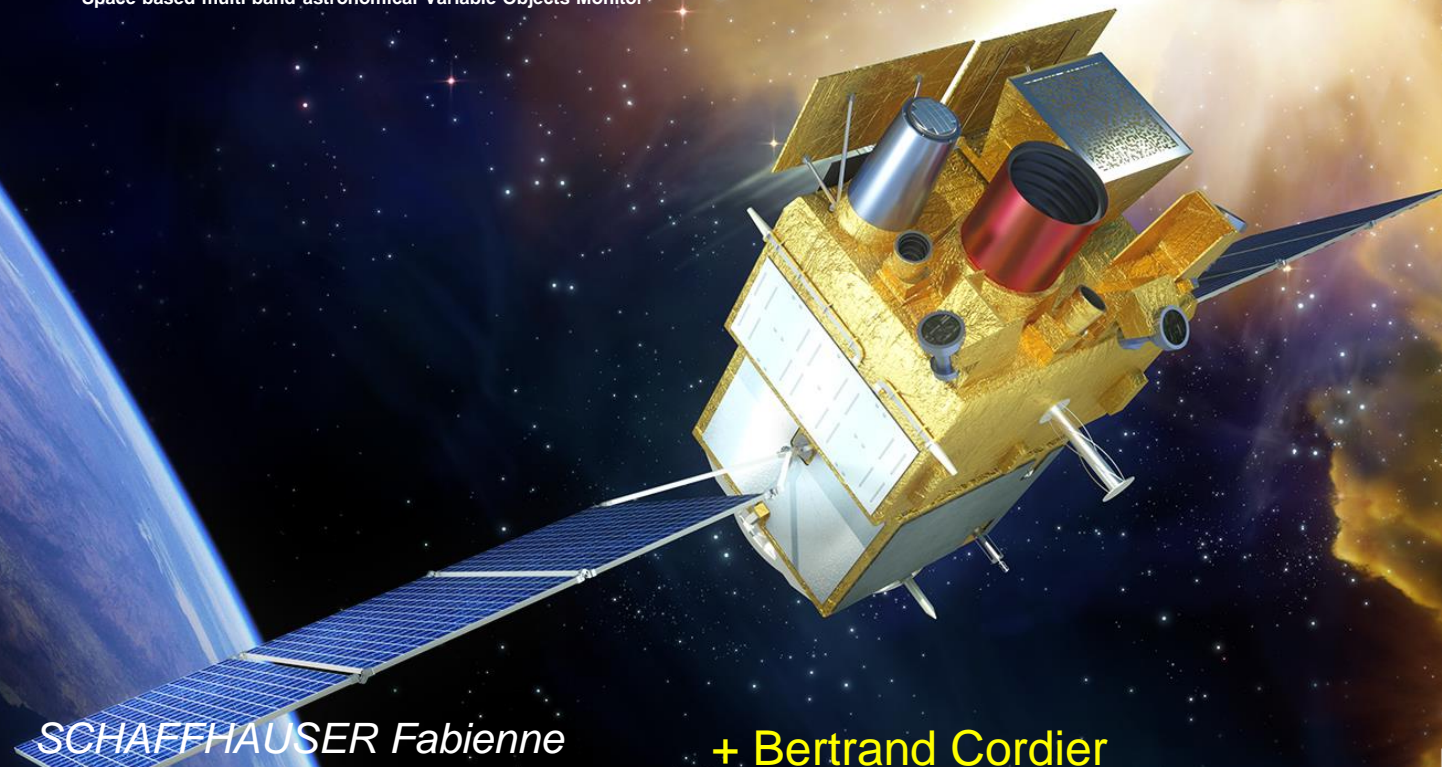




Space-based multi-band astronomical Variable Objects Monitor

System Tests status



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CNES

+ Bertrand Cordier



- ❖ 1- E2E test on SL QM
- ❖ 2 - Nominal mission scenario with a satellite simulator
- ❖ 3 - Ground System real time loops

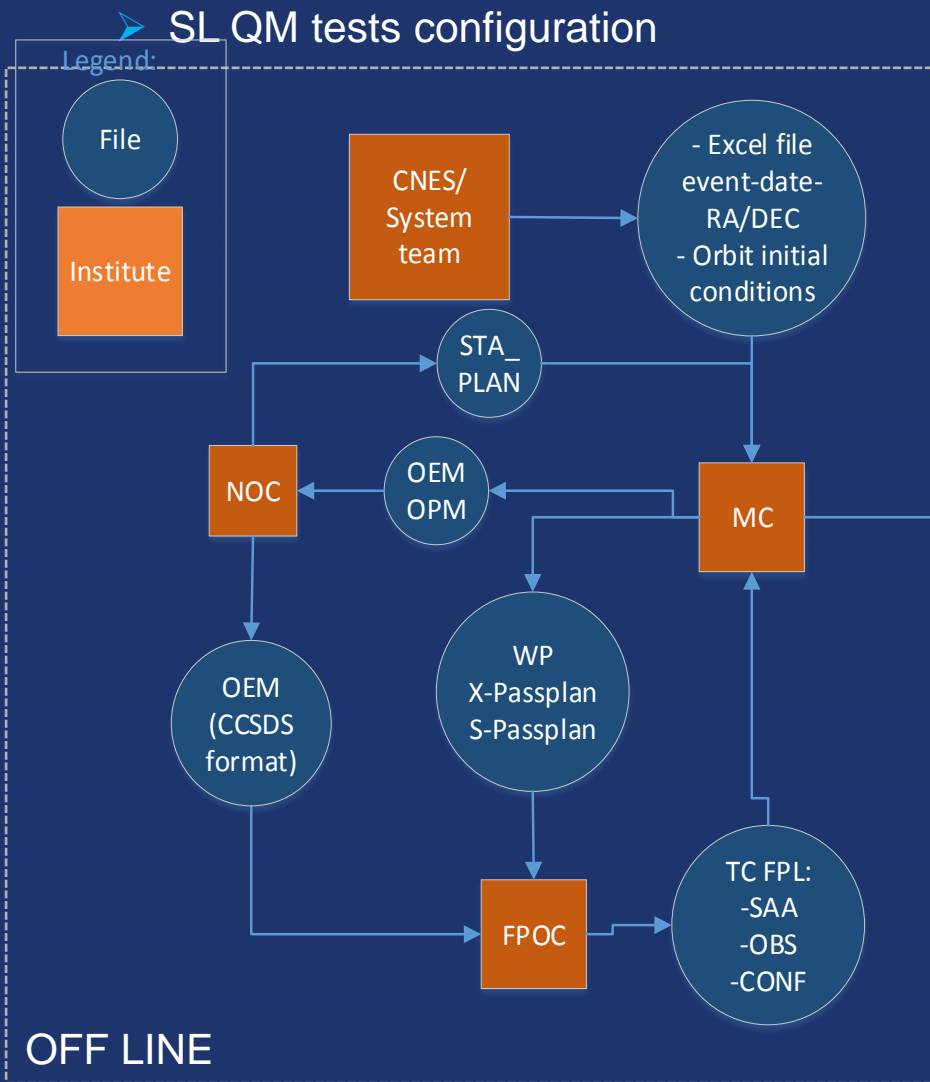
These slides have been prepared by Fabienne
I added in yellow my understanding of our contribution.

Objectifs of End to End on SL QM

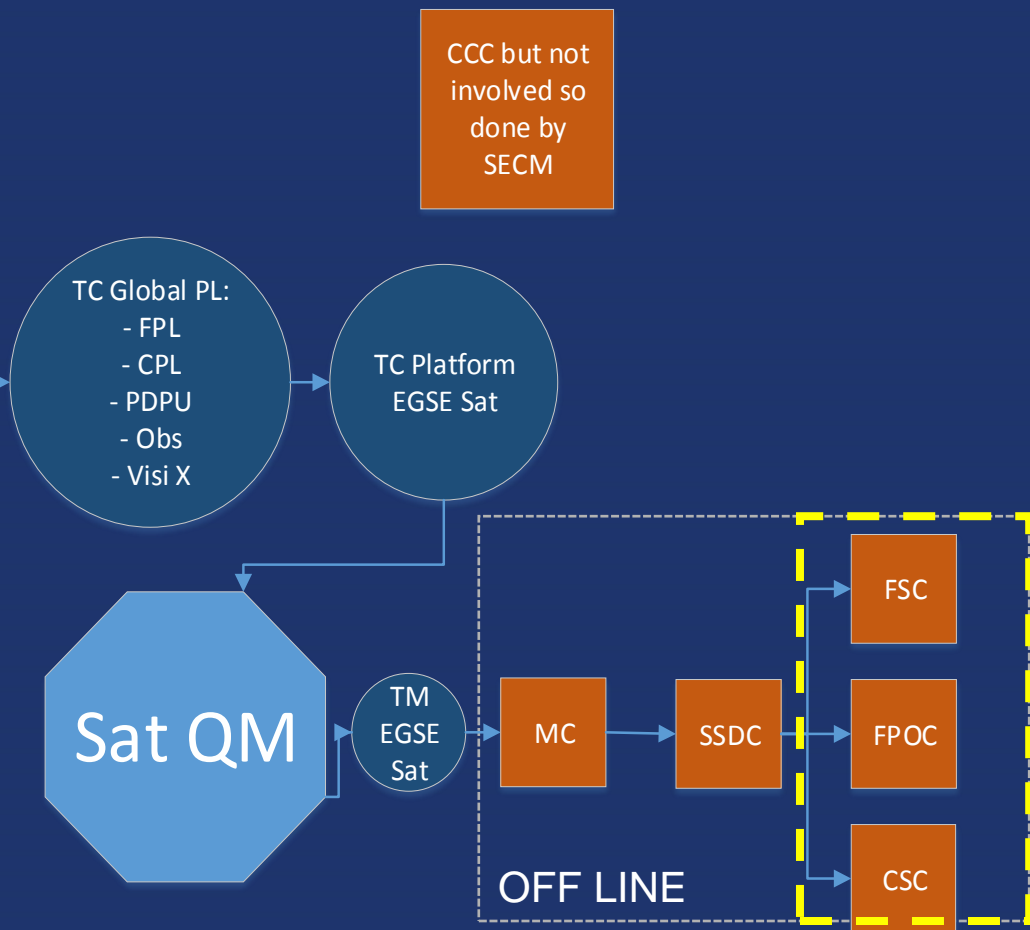
- ❖ To validate PL immediate and time-tagged telecommands chain
- ❖ To validate sequences of TC to configure PL (some specific configuration tables) and dump
- ❖ Max flows (to verify no loss of data)
- ❖ Routine test to validate programming loops
 - ToO and GP programming
 - GRB sequences (slew or not, with no MXT localization, GRM only, GRM first, Eclairs first,...)
 - To verify the interactions between the sending of the commands by PF to PDPU and PL instruments and the observations of the configurations through S, X and VHF band
 - No realistic data in the sequence?
 - Mass memory management, On board observations management
 - X-Band antenna on board management

FSC and CSC are Offline

VHF and L0c data are saved on a disk and are further processed at FSC/CSC



At SECM Shanghai



Configuration

At NSSC Beijing

- ❖ SL simulator connected to
- ❖ FPL simulator
- ❖ TT&C GSE, CSC, MC, SSDC
- ❖ FSC, FPOC, MIC, EIC
- ❖ DCN (to connect FPOC and FSC to MC, SSDC, CSC)
 - Warning to anticipate the set up of the DCN to be ready for the test
- ❖ S,X and VHF data to be put in the FPL simulator in line with the **mission scenario which will involve the scientists**
- ❖ **FSC process the VHF data**
- ❖ **CSC retrieves the VHF data**
- ❖ **FSC and CSC retrieve L0c data from NSSC and process the data (VHD data?)**
- ❖ **Synergy with the DC1 for the GP sequence and the GRB sequence**

Objectives

- ❖ To validate the system programming loop covering ~10 days of mission
- ❖ Upload of a new command plan while the previous one is still executed
- ❖ **Including routine, exceptional ToO and GRB sequences: by simulation of some pre-defined scenario (simulated data)**
- ❖ Mass Memory management
- ❖ Representativity of S-Band, X-band, VHF flows
- ❖ To validate the management of PDPU and X-band emitter
- ❖ HK0 et HK1 analyzed by FPOC
- ❖ **FSC and CSC are on line and process the received data**

3.1 GROUND GRB/ALERT LOOP (END 2020)

At NSSC Beijing

- ❖ It is the ground part of the alert system real time loop validation.
- ❖ It is focused on the alert distribution on ground with VHF simulated data
- ❖ Several VHF ground stations with test data simulating SL frames , NM
- ❖ FPOC, FSC
- ❖ MC, CSC, SSDC
- ❖ GIC, GFT, BA, VOEvent, GCN, GWAC, to be discussed with the scientists
- ❖ Synergy with the DC1, to be discussed with the scientists
- ❖ User (BA)@FSC/CSC processes the VHF data
- ❖ FSC/CSC send the VOEvent/GCN
- ❖ CSC retrieves the VHF data (and VHF scientific products)



Consultation meeting with the scientists on configuration, scenarios and responsibilities: 1st quarter of 2020

3.2 GROUND TOO_EX PROGRAMMING LOOP (END 2020)

- ❖ It is the ground part of the exceptional ToO system real time loop validation with a reactivity of less than 12 h once the request of implementation is being expressed by the PI or ToO scientist (Call to MC)
- ❖ MC, CCC, CSC
- ❖ FPOC
- ❖ Scientists, GIC (tbc), GFT(tbc), GWAC (TBC), ToO Advocate, VOEvent...to be discussed with the scientists
- ❖ User (ToO Advocate) at FSC/CSC resquests the ToO
- ❖ FSC and CSC retrieve L0c data from NSSC and process the data

3.3 GROUND TOO_MM PROGRAMMING LOOP (END 2020)

- ❖ It is the ground part of the Multi Messenger ToO system real time loop validation with a reactivity of less than 12 h once the request of implementation is being expressed by the PI or ToO scientist (Call to MC)
- ❖ MC, CCC (tbc), CSC,
- ❖ FPOC, FSC, FNOC (including Operational Orbit Control Center OOC),
- ❖ Scientists, GIC (tbc), GFT(tbc), ^{No realistic data in the sequence?} GWAC (TBC), ToO Advocate, VOEvent...to be discussed with the scientists
- ❖ User (ToO Advocate) at FSC/CSC requests the ToO_MM and FSC process the tiles
- ❖ FSC receives and process the VHF data
- ❖ CSC retrieves the VHF data (and VHF scientific products)
- ❖ FSC and CSC retrieve L0c data from NSSC and process the data

3 categories of tests;

- ❖ **End to end test on the satellite QM (april 2020)**
- ❖ **Nominal scenarion test using a satellite simulator (mid 2020)**
- ❖ **Ground system real time loops (end 2020)**

These tests are very exhaustive and may be too complex given the proposed schedule

We will have to discuss with the project to fully understand our involvement : a dedicated meeting will be organized first quarter of 2020

However, If we achieve the objectives of DC1 we should be ready for these tests