

MTG LI procurement status and expected performances

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11th MTG LI Mission Advisory Group
9th February 2021, via teleconference

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- I. MTG LI procurement status
- II. LI expected performances (only RFD status)=> no change since LI MAG10



LI PFM instrument design and procurement status



- The LI CDR has been closed. All lower level CDRs are closed.
- QR at lower levels in progress – LI level QR planned for the third quarter of 2021

Design

- the overall LI PFM design is complete



LI PFM instrument design and procurement status



Flight Hardware procurement status

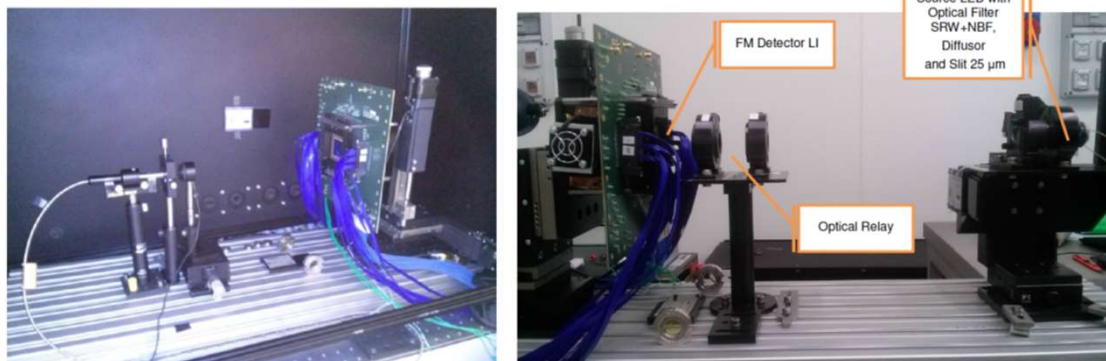
- All PFM flight hardware is available in house at Leonardo
- → this has been another very busy period organising lower level Test Reviews
- Survival Thermal Control (STC) box assembled and tested
- The Application Software (ASW) has been updated considering all issues / bugs found so far through Task Force #1 and through testing the LME, in particular 1553 and space wire issues have been solved.



LI detector status



- Flight units already delivered to Leonardo.
- Characterisation tests completed – the Quantum Efficiency is well within the specification (actually exceeding the specification of 70 %)
- Noise parameters well within specification
- Qualification campaign completed including radiation.
- Sun spot characterisation tests completed: no functional / performance loss observed when illuminating the non-active pixel area. For the active area, the correct functioning of the anti-blooming has been confirmed.
- Detector performances all very similar (both at AMS and at LDO)



Detector characterisation set-ups - courtesy Leonardo

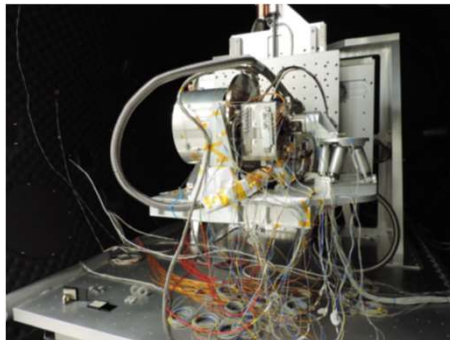


LI instrument design and procurement status

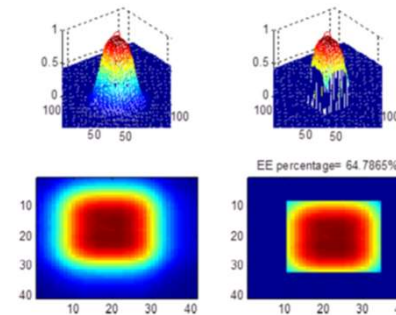


Assembly / Integration / Test: LOH

- the PFM integration is completed, testing in progress
 - all four telescopes have been integrated and tested – the wave front error test results are very good, well within the specs
 - the population of the Optical Channel (OC) printed circuit boards is complete. Some qualification issues are being addressed
 - the four Optical Channels have been assembled, aligned, and tested
 - alignment is good, within requirements, and stable to thermal and mechanical inputs



OC4 FPA alignment setup - courtesy Leonardo



Example of EE% calculation - courtesy Leonardo



LI instrument design and procurement status



Assembly / Integration / Test: LOH (continued)

- the four Optical Channels have been assembled into the LI Optical Head (LOH)
 - mechanical testing (sine and acoustic) successfully completed
 - CoG completed
 - thermal tests to start this week
 - followed by calibration/characterisation



LOH PFM on the CoG measurement machine- courtesy Leonardo



LOH PFM on the shaker- courtesy Leonardo

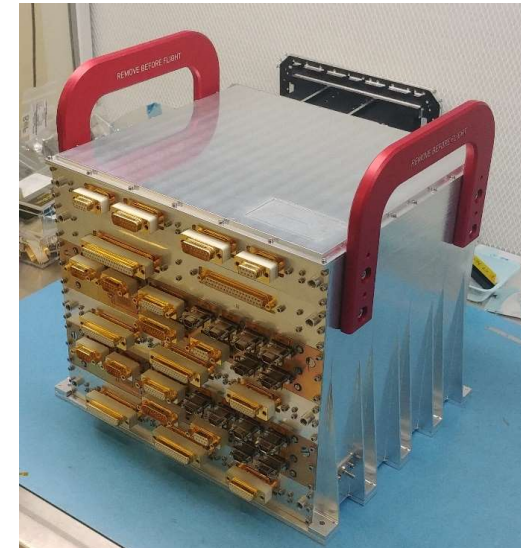


LI instrument design and procurement status



Assembly / Integration / Test: Main Electronics (LME)

- The PFM LME has been delivered to TAS-F (to be used in the MTG-I hybrid testing).
- The FM2 LME (to be used on LI PFM) has been assembled
 - Initial electrical/functional test completed
 - Vibration test completed
 - Thermal test completed
 - EMC test completed
 - ASW updated (fix of SPRs)
 - Final functional test about to be performed



LME FM2 integrated and electrical test completed - courtesy Leonardo



LI instrument design and procurement status



Assembly / Integration / Test: LI PFM

- The PFM LOH and FM2 LME will be brought together to form the LI PFM
- The expected LI PFM delivery is foreseen mid 2021
 - in line with the TAS-F need date
 - slipped compared with the last MAG meeting, but much progress has been made with few steps remaining.
 - PFM hardware is being given the highest priority



LI Performances: status of RFDs



- The LI full functional validation including mechanical and thermal balance tests and finishing with optical vacuum where calibration and characterisation will be completed by mid 2021.
- The LI performance as presented during last LI MAG 10 have not evolved – The LI instrument tends to being almost fully compliant with few RFDs which status depicts the status of the performance => see next slide
- The preparation for the In-Orbit Verification has started – discussions with EUM/ESA and industries ongoing.



LI Performance RFD's status – Shared and discussed with EUM

ESA AD03 req	URD req	content	Reference number	comment
PL-LI-090	URD-REQ-125	Lightning event radiometry	MTG-GA-LI-RFD-010_Iss4	only for SRZ as presented at the last MAG
PL-LI-100	URD-REQ-127	Background radiometry	MTG-GA-LI-RFD-010_Iss4	only for SRZ - idem
PL-LI-110	URD-REQ-129	IADP/DE	MTG-GA-LI-RFD-034_Iss2	Compliant – No RFD
PL-LI-140	URD-REQ-132	ASPKE	MTG-GA-LI-RFD-020_Iss2 MTG-TAS-F-SAI-TN-1054_Iss. 6	Nominal case: - N/S 3,95 km (reqt = 4 km) - E/W 5,43 km (reqt = 4 km) Case with FCI TED including security factor + ground processing of scan encoder measurements - N/S 5,12 km (reqt = 4 km) - E/W 4,85 km (reqt = 4 km) MTG-I LI INR feature improved, thus potentially removing the non-compliance.
PL-LI-160	URD-REQ-134	ASPKE eclipse conditions	MTG-TAS-F-SAI-TN-1054_Iss. 6	Similar as above
PL-LI-180	URD-REQ-136	Dataset completeness	MTG-GA-LI-RFD-035_Iss1	Compliant when relevant RFDs will be accepted
PL-LI-190	URD-REQ-137	Dataset accuracy	MTG-GA-LI-RFD-023_Iss1	Compliant when relevant RFDs will be accepted
SA-AVA-030	URD-REQ-194	Availability	MTG-GA-LI-RFD-036_Iss2	Withdrawn – compliance expected at MTG-I level Expected to be Compliant
PL-LI-040	URD-REQ-004	LI triggered event TM content	MTG-GA-LI-RFD-039_Iss.2	Accepted by ESA and Submitted to EUM – Expected to be accepted by EUM

