

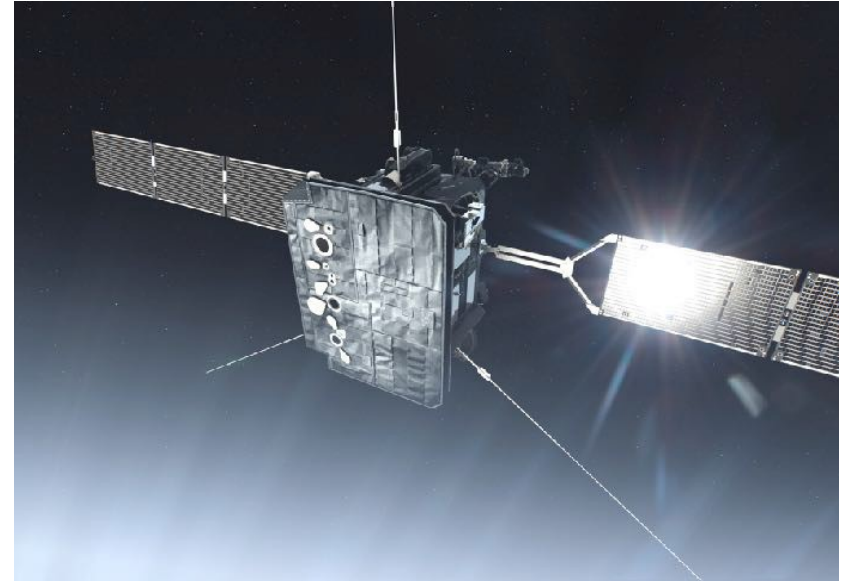


RPW Consortium Meeting #23 – RPW General Status

E. Lorfèvre - September 30th 2019

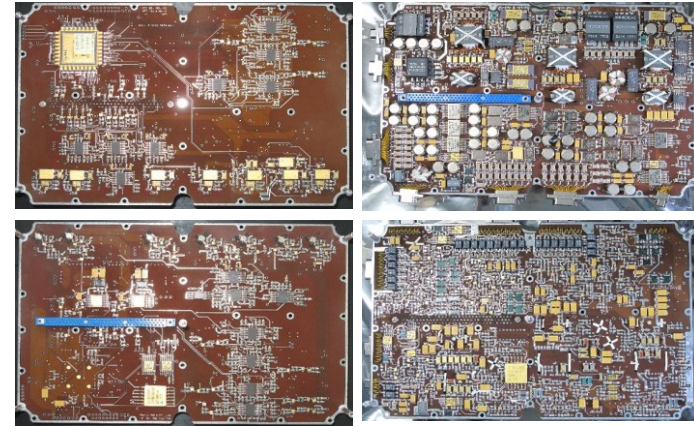
Agenda

- **MEB / SCM**
- **Antennas**
- **S/C AIT Progress**
- **System and S/C Coming Activities**
- **Open Issues and Concerns**



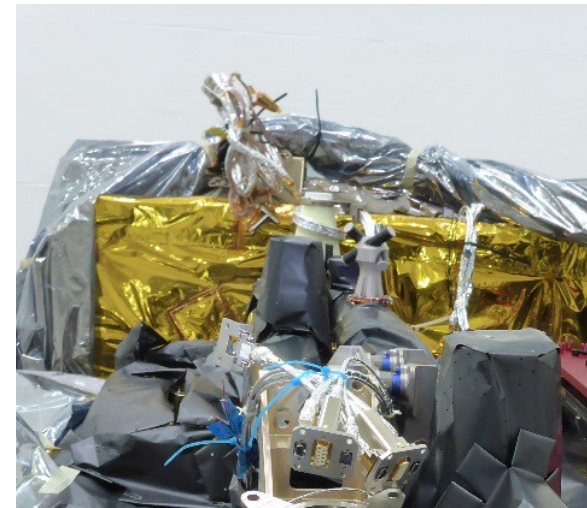
MEB

- **MEB software update successfully done**
- **MEB/ LVPS-PDU spare boards (ASU, CZ)**
 - PFM1 : reduced EMC tests carried out, NCR to be investigated before delivery
 - FS2 : manufacturing completed: many defects observed, repairs performed before testing,
 - ➔ major anomaly detected during preliminary tests and corrected
 - ➔ EMC testing performed. Successful results excepted some minor discrepancies



SCM

- **SCM FS installed on I-BOOM on S/C early January 2019**
 - Cleaning and inspection after S/C mechanical test performed in July
 - MLI installation done by ADS on July



ANTENNAS

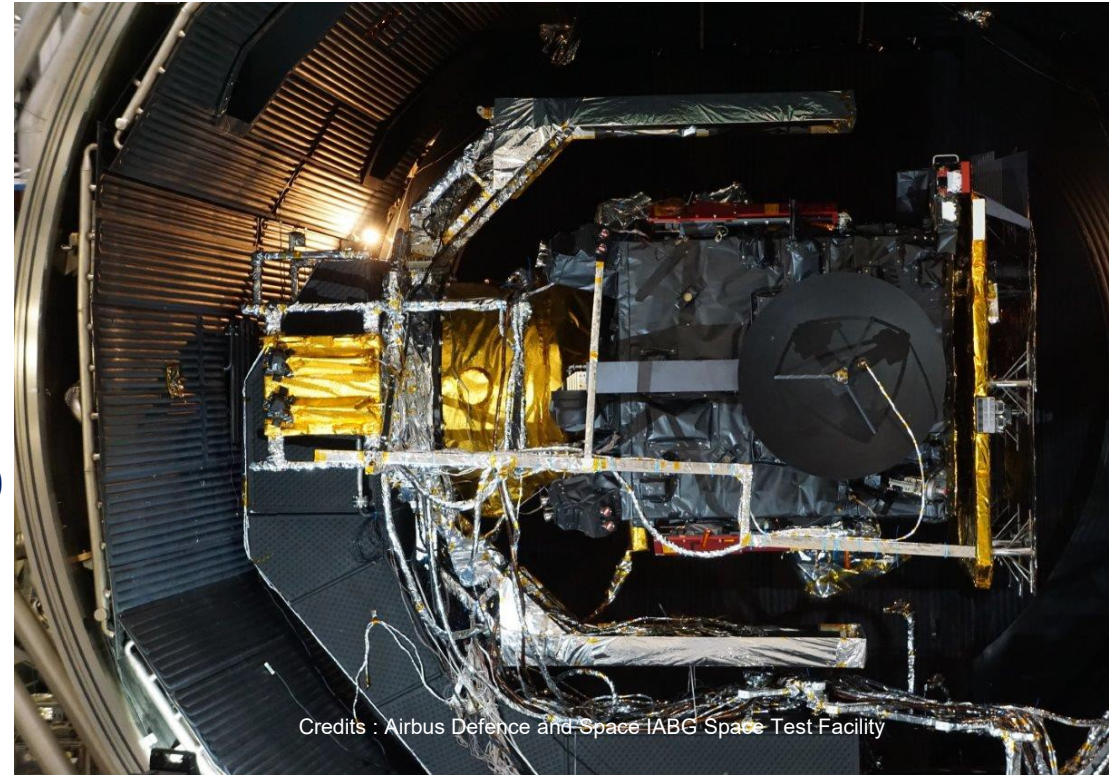
- **3 RPW antennas delivered on 28/06/18**
 - PY & MY antennas installed on S/C end of July 2018 (before TVAC)
 - PZ antenna installed on the satellite early January 19 (after TVAC)
- A post-mechanical test inspection has been performed last week
- From last year:
 - 11 damages on the antennas heatshields have been observed leading to 1 replacement early January 19,
 - 2 tears on the PY and PZ hinge MLI, replaced in January and September 19
 - PY & MY hinge micro-switches bent
 - RPW PY antenna boom mark and MLI punctures



Credits : Airbus Defence and Space IABG Space Test Facility

S/C AIT Progress

- **S/C TVAC test in December 18**
- **Mechanical tests Feb to Mid-March 19**
- **SCM FS MLI finalization in July 19**
- **Background for EMC test preparation in April 19**
- **FFT debug on ETB in May 19**
- **EMC & RPW compatibility tests in May 19**
- **RPW FFT in EMC chamber in May 19**
- **Magnetic test in June 19**
- **Delivery of new IDB in July 19**
- **SCM FS MLI finalization in July 19**
- **RPW flight S/W upload in May (SVT1a) and August (SVT1b)**
- **Post mechanical test inspection of RPW antennas in September 19**



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Activities at S/C Level

Last steps involving RPW

- IIC on ETB : 07-09/08/2019
- MAG-RPW/SCM synchro test on ETB with final MAG SW: Test procedure issued mid March 19. Test date TBD
- **Inspection of RPW antennas on launch site : not agreed by ESA/ADS**

Open issues and concerns

- **Communication**

- too restrictive email list imposed by ESA
- lack of information about test progress, results, pictures

- **Contamination**

- RFD sent by AIRBUS to RPW. To be updated according to latest analysis. Cleaning required. Complete results of acid nitric tests pending

- **EMC and FFT**

- Noisy background due to APR converters (120kHz) and its harmonics → some frequencies might have been missed (EMC).
- V2/PY input not well connected by ADS

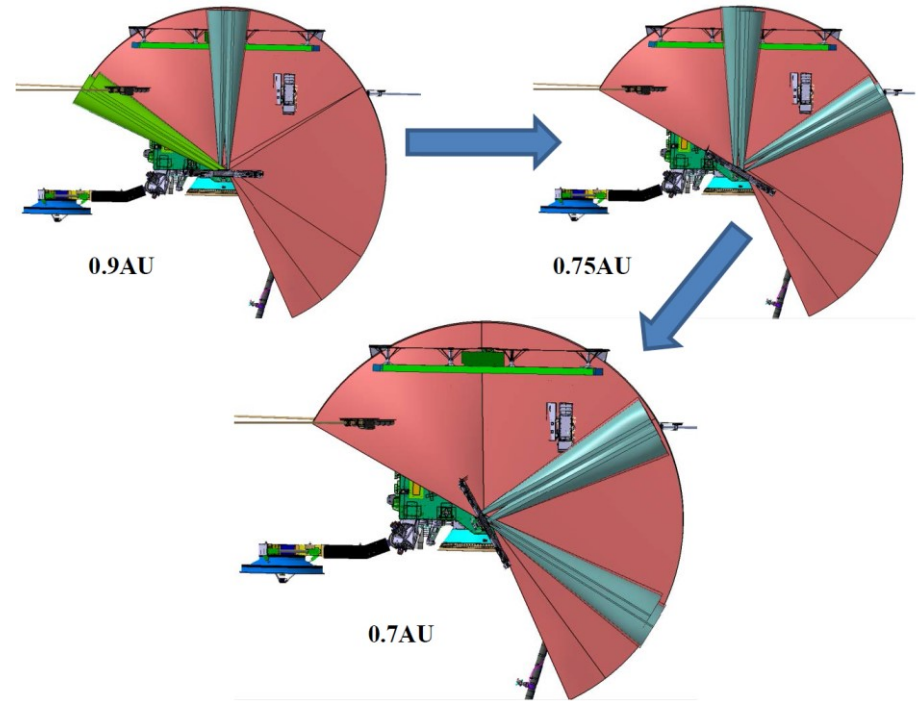
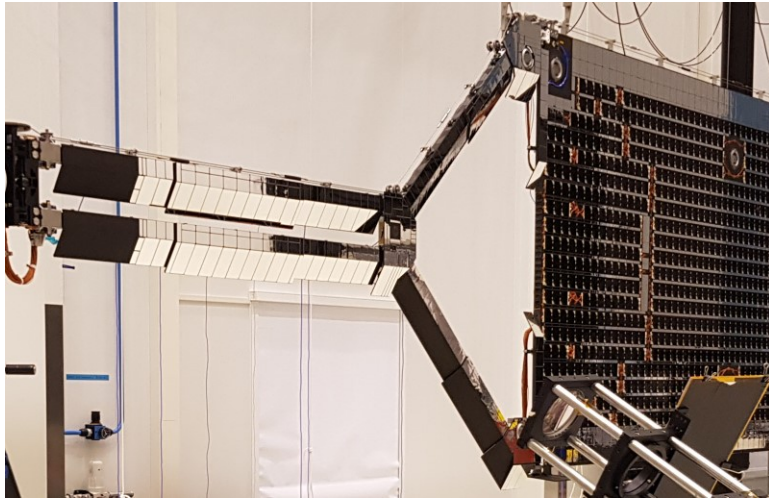
- **Antennas**

- Damages on heatshields + hinge MLI + micro-switches
- Inspection on the launch site
- **OSR yoke reflections onto PY & MY antennas**



OSR Yoke Reflections onto PY & MY Antennas 1/2

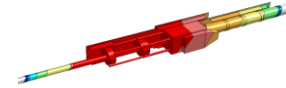
- Yoke OSR reflections impact RPW Black Kapton MLI and PA radiator (>0.9 AU)
- Current thermal impact investigation focus on MLI impact
- The combined impact of thruster activation is considered



OSR Yoke Reflections onto PY & MY Antennas 2/2

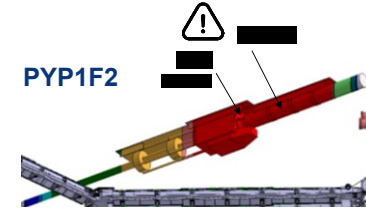
- **Edge and Boom could experience up to 324°C (6136 W/m²)**
 - Y966 effective adhesive areas of edging are located on oriented surfaces
 - Boom coating degradation ⇔ Antenna performances degradation
- **MLI Cone confined : low view factor toward the space → High temperature could be reached**
- **RPW MLI worst case : 301°C**
- **Thruster impact: +21°C on lateral surfaces, +27°C on rear surfaces**
- **Estimation of temperature with different coatings**

PYP1F1



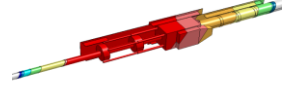
With peak flux 4.65 kW/m²

PYP1F2



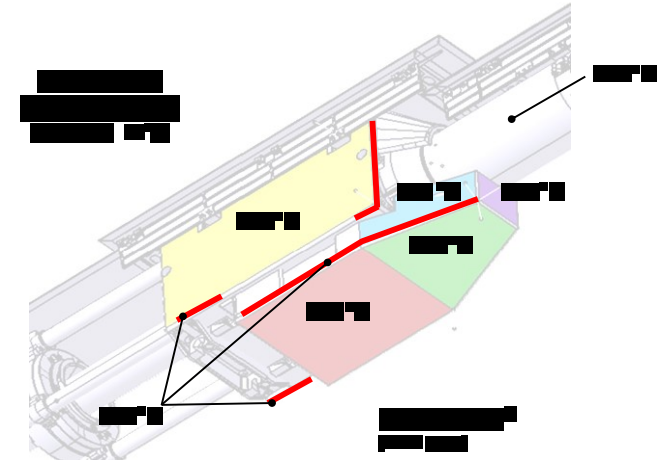
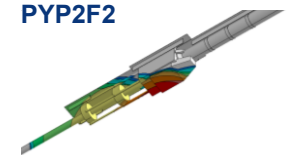
With peak flux 6.1 kW/m²

PYP2F1



With peak flux 2.89 kW/m²

PYP2F2



	Black Kapton	Germanium	GCC
Front orientation	324°C	281°C	201°C
RPW MLI	301°C	261°C	187°C

BACKUP SLIDES