Proba-V CC Status & Super-Resolution Experiment Proposal

TEC-SPS

26/06/2020

European Space Agency

Proba-V Companion Cubesat - Status & Schedule

Proba-V CC Activity Overall Schedule

ACTUAL

2018		2019				2020				2021	
Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2

Phase A-B
Phase C
Phase D-E1

KO PM1 PDR PM2 PM3 CDR Today Launch

~ 9 Months

PLANNED

Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
2018		2019				2020				2021	

European Space Agency
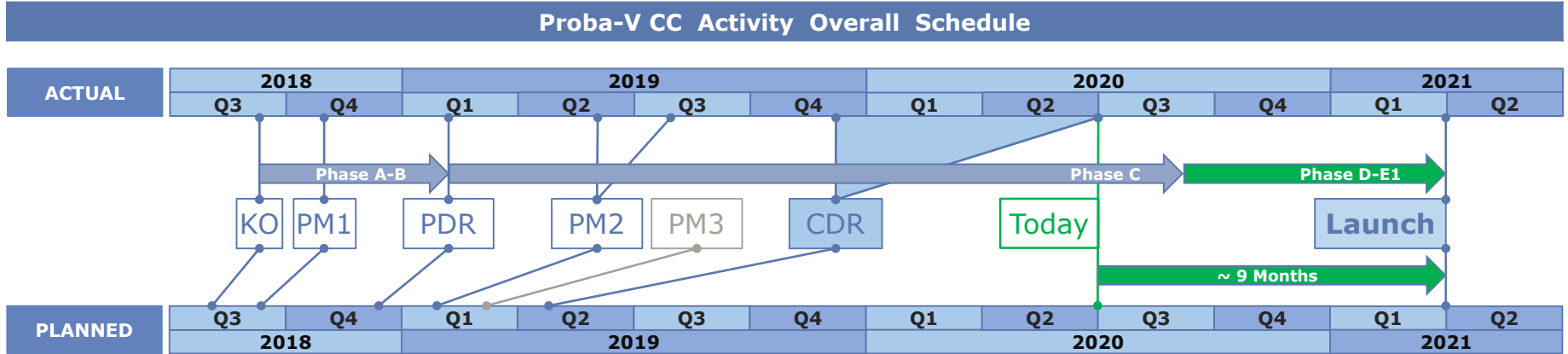
Proba-V CC – Running and Upcoming Activities

✓ **CDR successfully achieved** (end Q1-2020)

✓ **Phase C "Bridging" Activities** (Q2-2020 -> Q3-2020)

- ■ Bridge between Phase A/B/C and Phase D/E1

- ■ Phase C complementary activities in order to:

  - • Further advance GS (PDGS+FOS)

  - • Further advance OBSW and AOCS SW

  - • Perform STM qualification

  - • Perform Structural and Thermal validation

✓ **Phase D/E1** (Q4-2020 -> Q2-2021)

- ■ Launch: End Q1/2021 (depending on launch availability)
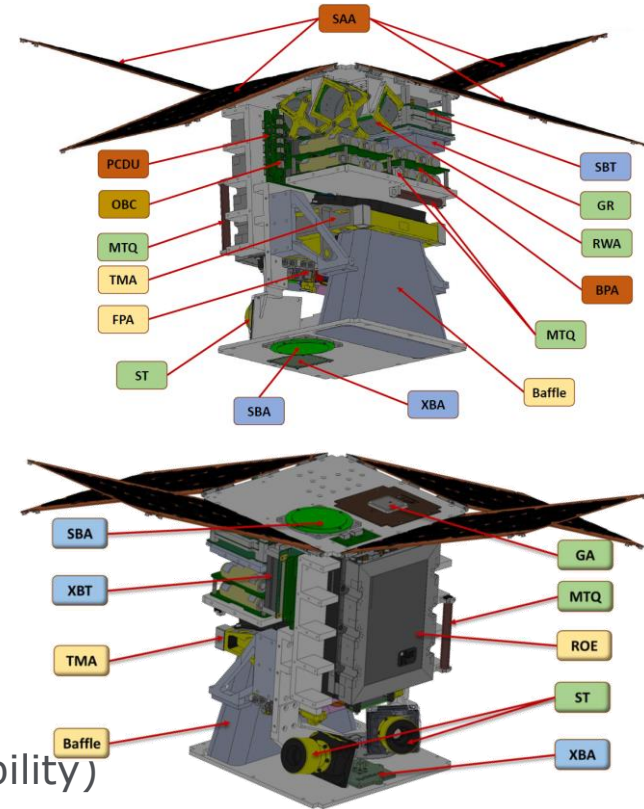
PVCC extra details

✓ **Launcher**
  - Flexi-ticket with SpaceFlight
 - Falcon 9 and PSLV options

✓ **ITU process**
  - Process started end 2019
  - API/A sent out to Belgian Institute for Postal Services and Telecommunications (BIPT-national ITU) (Week 18)
  - Currently waiting for BIPT answer

✓ **FOS-REDU**
  - Demo of TMTC capabilities (Week 27)
 - Redu HW in the loop at ASL test (Summer/Q3)

✓ **PDGS-VITO**
  - ICD from ProbaV shared by VITO
  - ICD from ASL on going
  - Raw data needed for calibration and data ingestion validation already available

European Space Agency
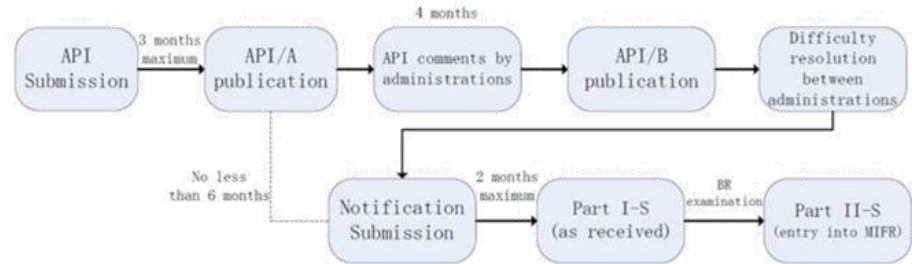
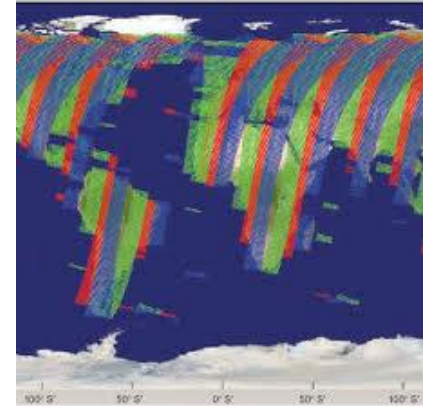# Super-Resolution Experiment (Concept)

Background/Previous Activities:

Super resolution (ground post processing) techniques have been successfully developed using proba-v data from subsequent observations ("uncorrelated" – images from successive overpasses).
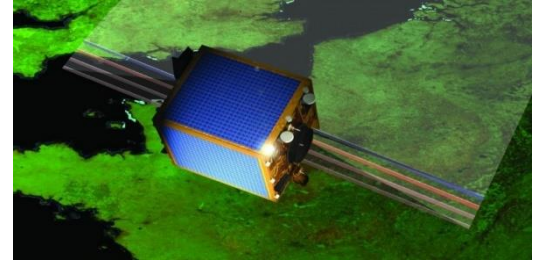
Idea:

Implementation of super resolution techniques on "oversampled" acquisition lines ("correlated" – same ground surface imaged over multiple pixels, same overpass).

European Space Agency

Super-Resolution Experiment (Acquisition)

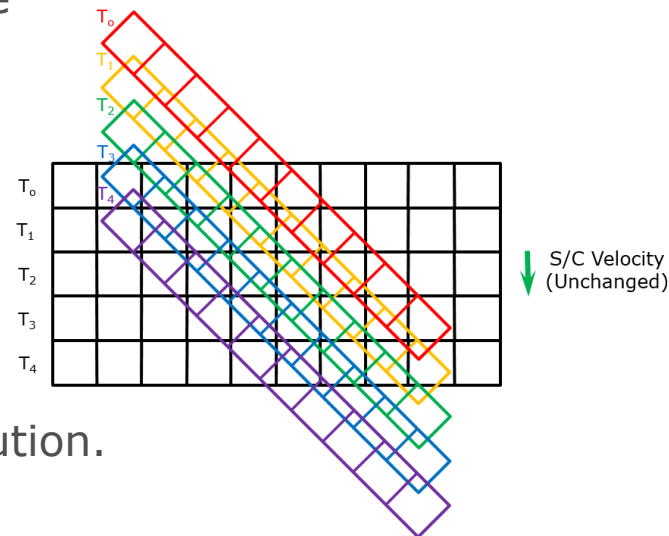**Images Acquisition Strategy:**

Yaw rotation of satellite of (e.g.) 45 deg, to oversample same areas on multiple pixels.

Implementation Steps:

Assessment of feasibility (possible latitudes range, P/F limitations, etc.),

Manoeuvres' profiles' definition and simulation,

Operational procedures' definition, validation and execution.

Possible Implementation Approach:

Implementation: Ad-Hoc Task in the frame of the proba-v ops support contract.

S/C Velocity (Unchanged)

Super-Resolution Experiment (Processing)

Data processing approach:

Elaboration/implementation and verification, on real image data with above characteristics, of interpolation/super-resolution techniques.

Possible Implementation Approach:

-> Small Activity in the frame of VITO proba-v Support Activity?

-> New Activity in the frame of the ESA Discovery Program?

-> Others?

Implementation/Planning: TBD