living planet symposium | BONN 23–27 May 2022

TAKING THE PULSE OF OUR PLANET FROM SPACE

Proba-V Companion Cubesat (PVCC)

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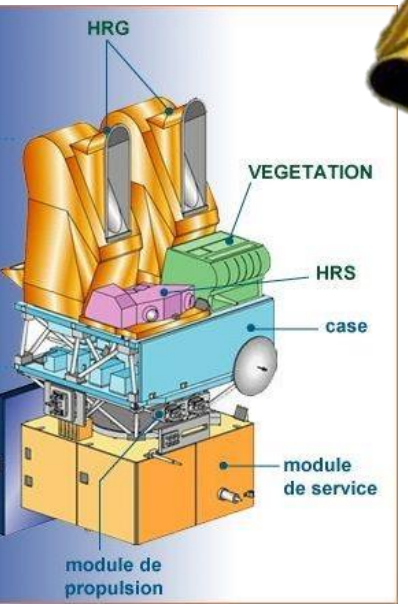
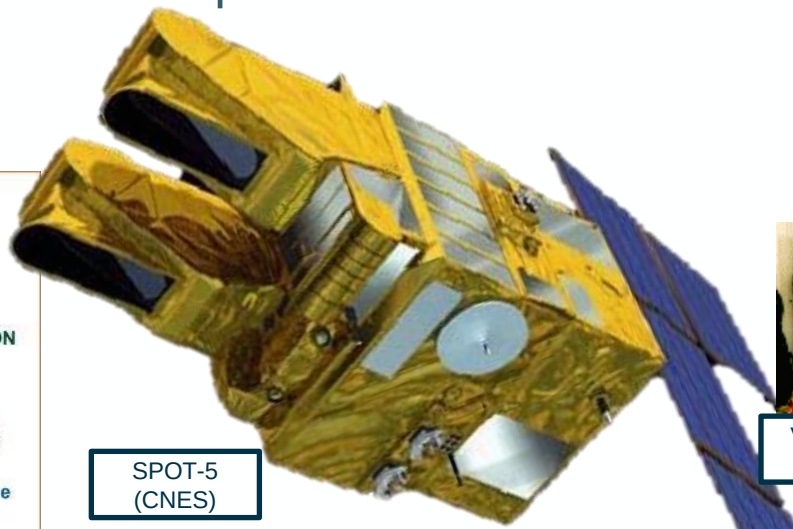
23/05/2022

Proba-V Companion Cubesat Objectives

The **Proba-V Companion Cubesat (PVCC)** is an **In-Orbit Demonstration** targeting the assessment of the performances of a **known payload on a tailored 12U cubesat platform**

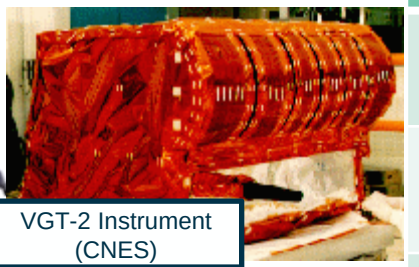




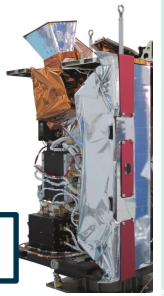
SPOT-5 (CNES)

Proba-V (ESA)

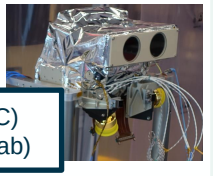
PVCC (Aerospacelab)



VGT-2 Instrument (CNES)



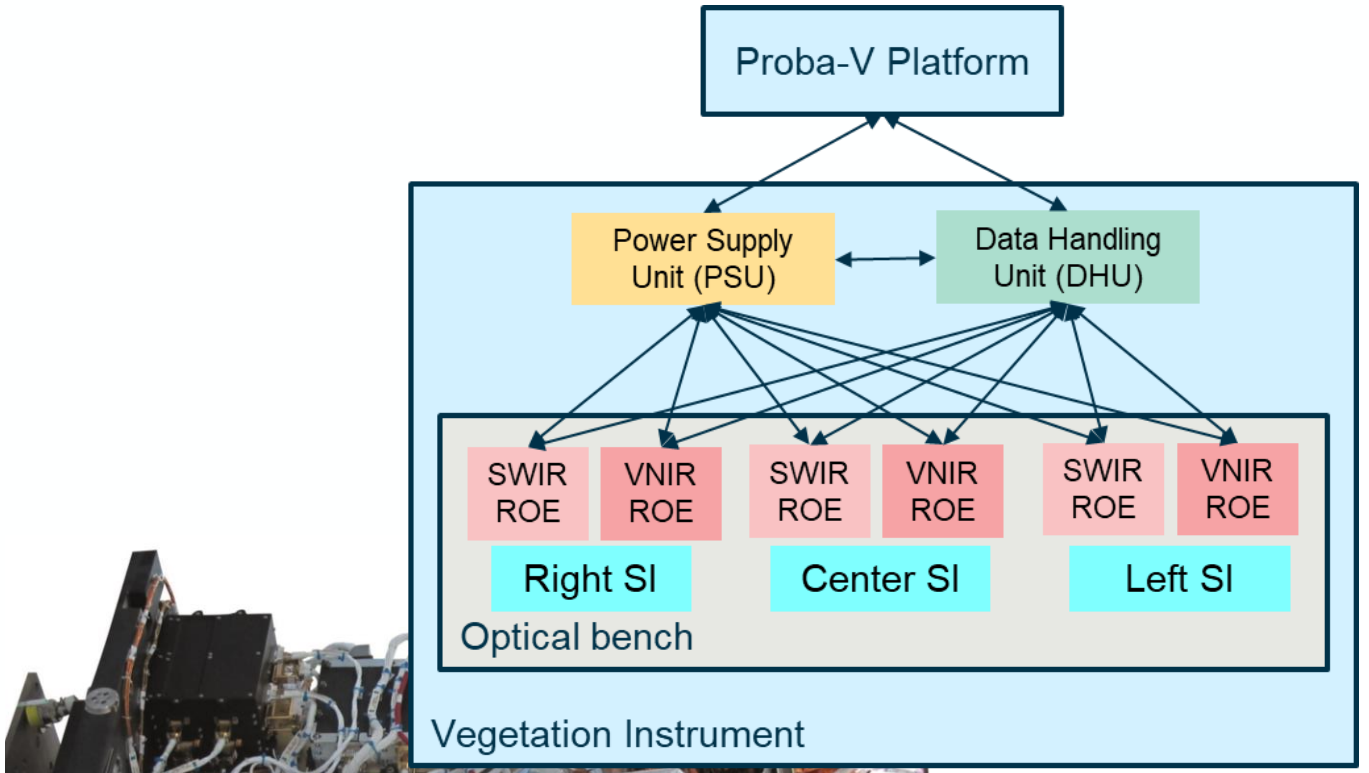
VGT (Proba-V) Instrument (OIP)

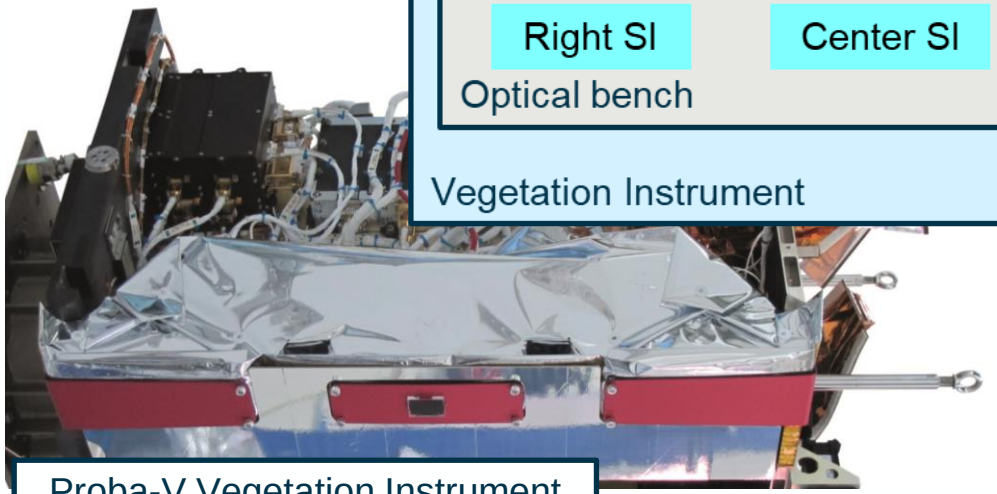


VGT (PVCC) (Aerospacelab)

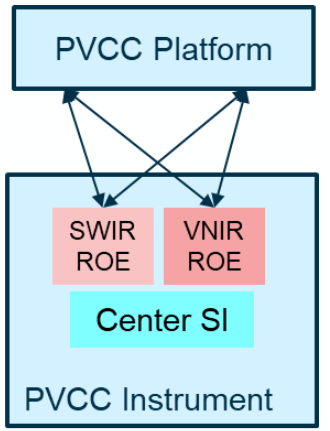
Satellite name	Instrument	Satellite Mass (kg)	Satellite Dimensions (m x m x m)
Spot 4	VGT 1	**2760**	**2 x 2 x 5.6**
Spot 5	VGT 2	**3000**	**3.1 x 3.1 x 5.7**
Proba-V	VGT (Proba-V)	**158**	**1 x 1 x 1**
PVCC	Proba V Spare SI#3	**18**	**0.2 x 0.2 x 0.3**

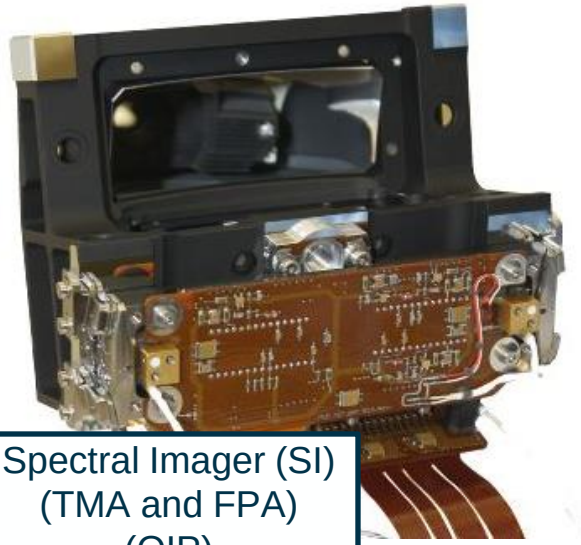
Proba-V / PVCC instrument comparison



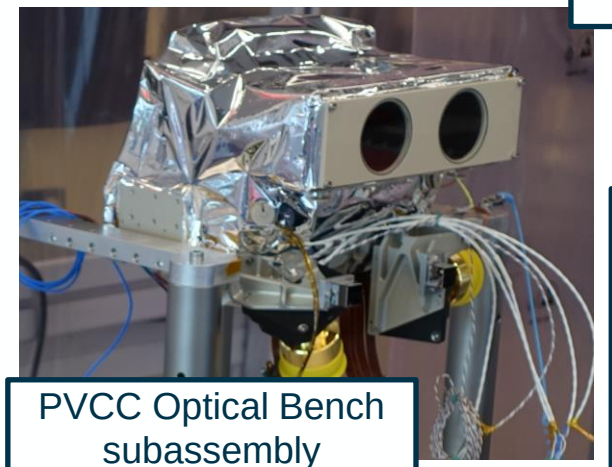


Proba-V Vegetation Instrument (OIP)





Spectral Imager (SI) (TMA and FPA) (OIP)



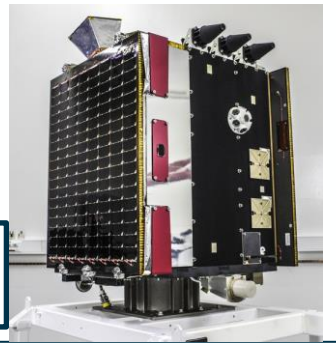
PVCC Optical Bench subassembly (Aerospacelab)

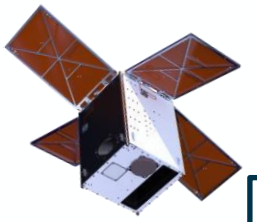
SI: Spectral Imager
TMA: Three Mirrors Anastigmat
FPA: Focal Plane Assembly
ROE: Read-Out Electronics
VNIR: Visible and Near InfraRed
SWIR: Short-Wave InfraRed

Proba-V / PVCC comparison

	Proba-V	PVCC	Comments
Altitude (km)	820	564	PVCC final altitude TBC by launch services provider
GSD at Nadir	VNIR : 97 m SWIR : 186 m	VNIR : 67 m SWIR : 128 m	GSD: Ground Sample Distance
Ground Speed (km/s)	6,6	7,0	
Native sampling time (ms)	VNIR: 14,7 SWIR: 28,3	VNIR: 9,6 SWIR: 18,4	Assuming a square sample
Integration Time Range (ms)	VNIR: 1,2 – 11,3 SWIR: 0,4 – 22,3	VNIR: 1,2 – 6,2 SWIR: 0,4 – 12,4	
Satellite Mass (kg)	158	18	

Proba-V





PVCC

SI: Spectral Imager
TMA: Three Mirrors Anastigmat
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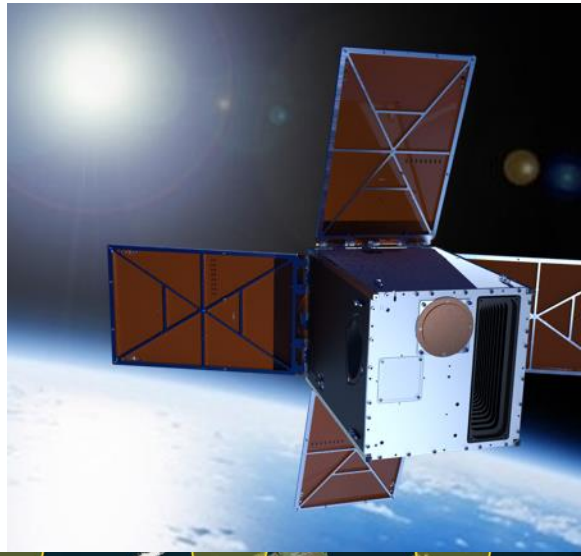
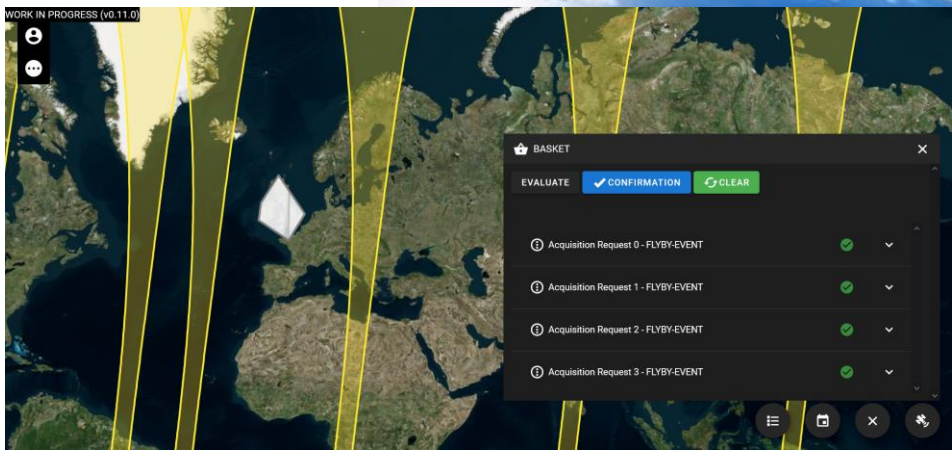
ROE: Read-Out Electronics
GSD: Ground Sample Distance
VNIR: Visible and Near InfraRed
SWIR: Short-Wave InfraRed
TBC: To Be Confirmed

PVCC Payload development overview

- Space segment
  - New development of **DHU and PSU electrical interfaces** (delta-design of PCDU and OBC)
  - New development of **payload manager software**
  - New implementation of **compression algorithm** in software
  - Update of **Baffle design** and new **manufacturing** process
  - New development of **optical bench mechanical interface and thermal insulation**
- Ground segment
  - New development of **Mission Control Center SW** and interface with existing hardware
- Launch segment
  - Use of **dedicated loads isolation** solution
- User segment
  - New development of **User tasking interface** geared towards Calibration
  - Update of **raw data format** (adaptation to faster line rate)
  - **For PDGS updates, refer to VITO presentation at 16:55 in this room**





Tasking interface in focus

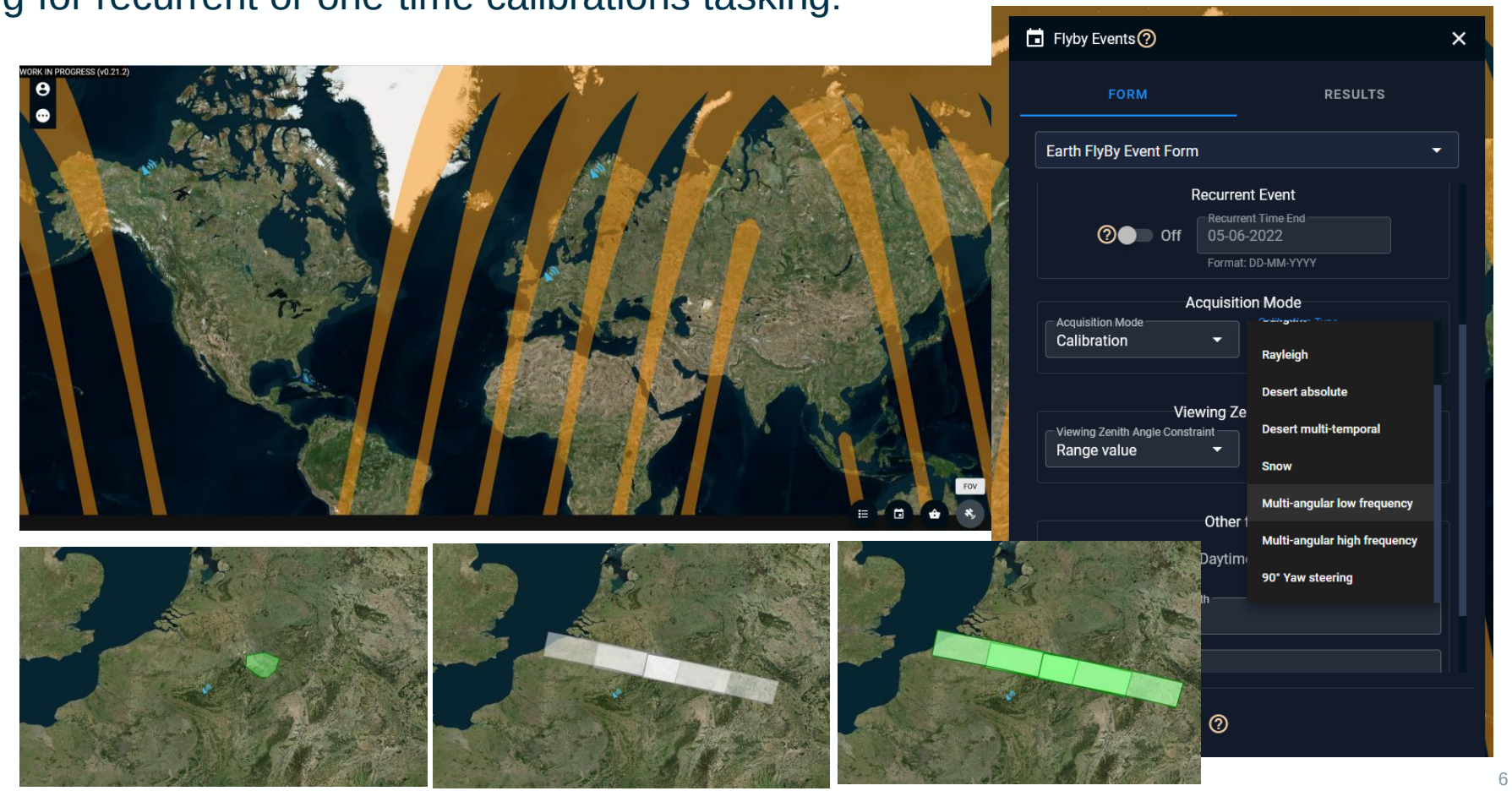
The Tasking interface replaces the IPC (image programming center) and the nominal «land-sea mask»

Web-based interface allowing for recurrent or one-time calibrations tasking:

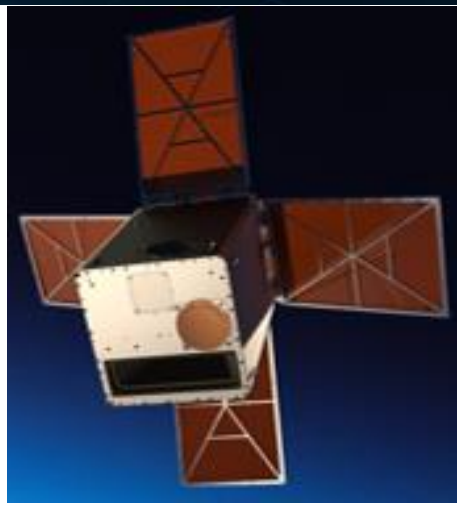
- Moon calibration
- Nadir observation
- 90° Yaw steering
- SNO
  - supports other satellites for cross-calibration

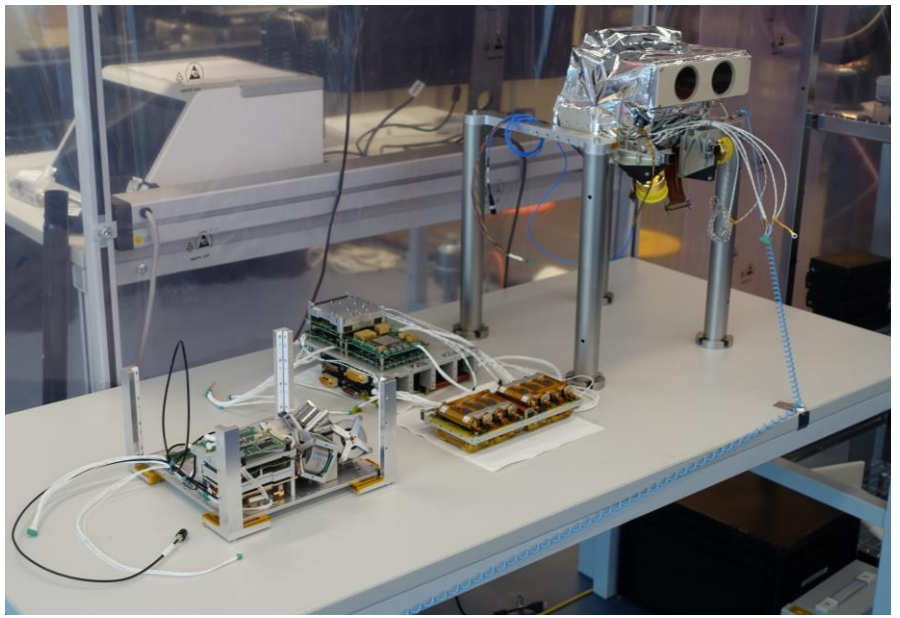
- Will be operated by **VITO**

- Interface between **User** and **Mission Control Center**



PVCC mission timeline overview





Segment	Status	Comment
Space segment		• Proto-Flight Model (**PFM**) integration • Functional test campaign
Ground segment		• Definition of Phase E2 (operations)
User segment		• Tasking Interface iteration with User feedback • PDGS development (cf. presentation from VITO)
Launch segment		• Target Launch **VV23 End of 2022**
Support segment		• ITU Frequency Coordination and licensing

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Thank you for your attention

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