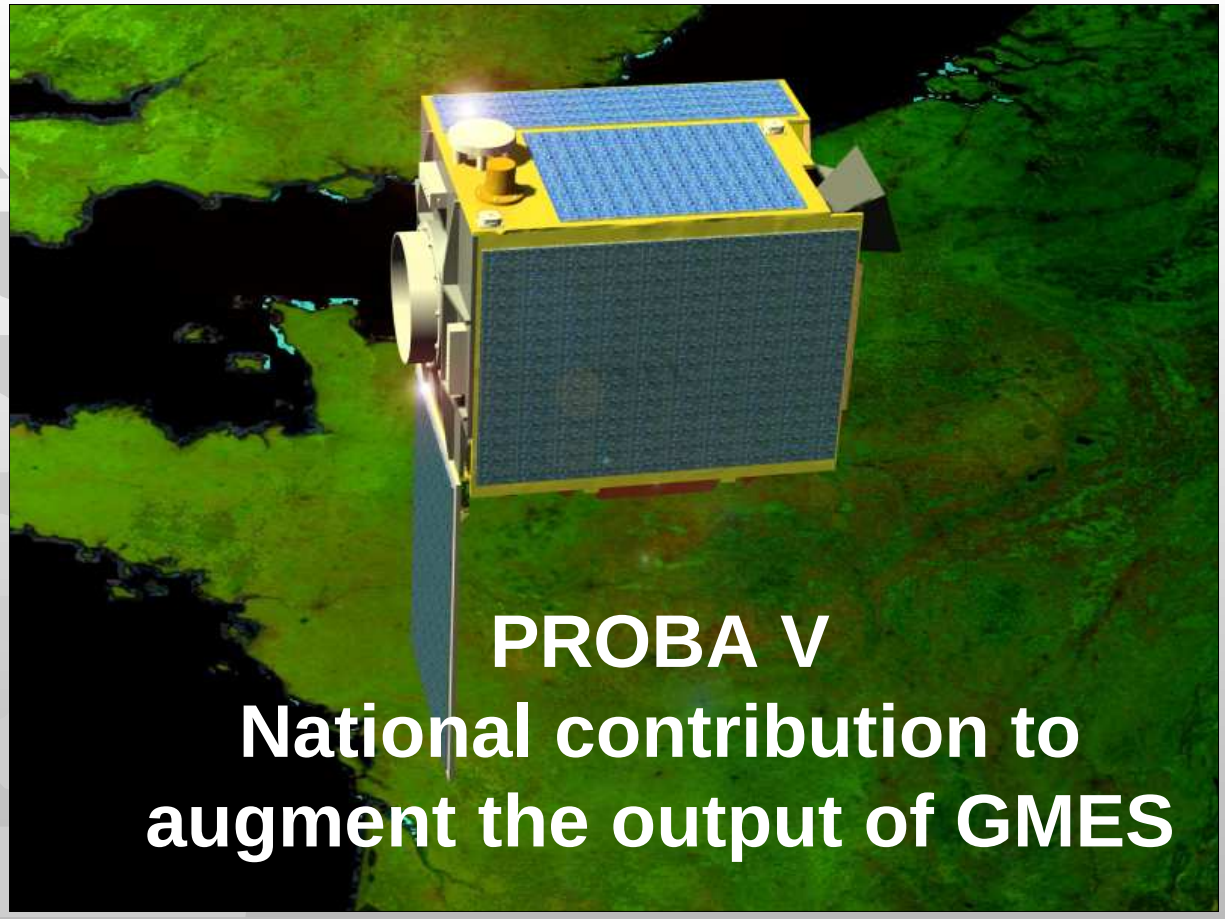


PROBA V
National contribution to augment the output of GMES

GMES CONTEXT

- GMES space component :
  - Elements provided by ESA (Sentinel satellites)
  - Elements provided by Eumetsat
  - Contribution by national entities : B+E+D+I
- ESA provided satellites were defined by a gap analysis :
  - Space observation requirements derived and compared with available and planned missions from EU/ ESA member states and Eumetsat
  - Leads to compromises to accommodate as much user requirements within a limited number of big missions

Small mission allows to have focused mission objectives

PROBA V mission

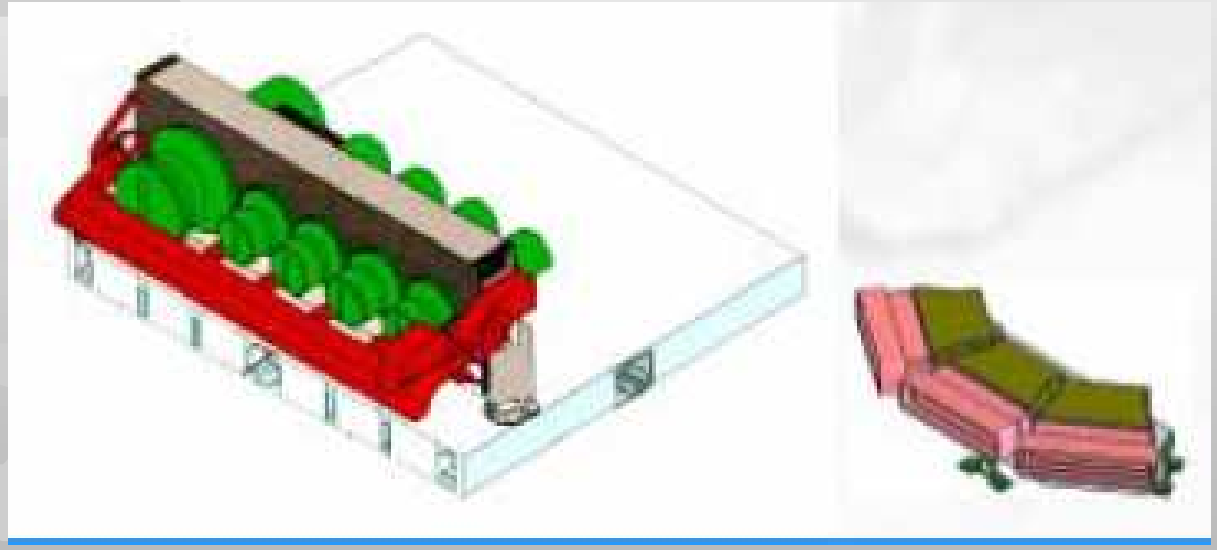
- Demonstrated focused mission objectives with small platforms :
  - PROBA 1: hyperspectral + HR optical
  - Topsat : HR optical
  - DMC : disaster monitoring

- Enhanced data continuity to Vegetation (VGT) :
  - Since 1998 the VGT Mission (SPOT 4&5) has operationally delivered to its users daily global monitoring of continental surfaces at 1 km resolution
  - PROBA V will provide daily global monitoring at 100 m to 300 m resolution
  - VGT mission will be continued by the Sentinel 3 of GMES as from 2013

VGT missions comparison

VERHAERT SPACE
A QinetiQ Company

Parameter	Spot VGT	Available for LandObs
Mass	152kg	± 25kg
Volume	700 x 1000 x 1000 mm^3	± 200 x 800 x 500 mm^3
Power consumption	200W	± 30W



PROBA V Key applications

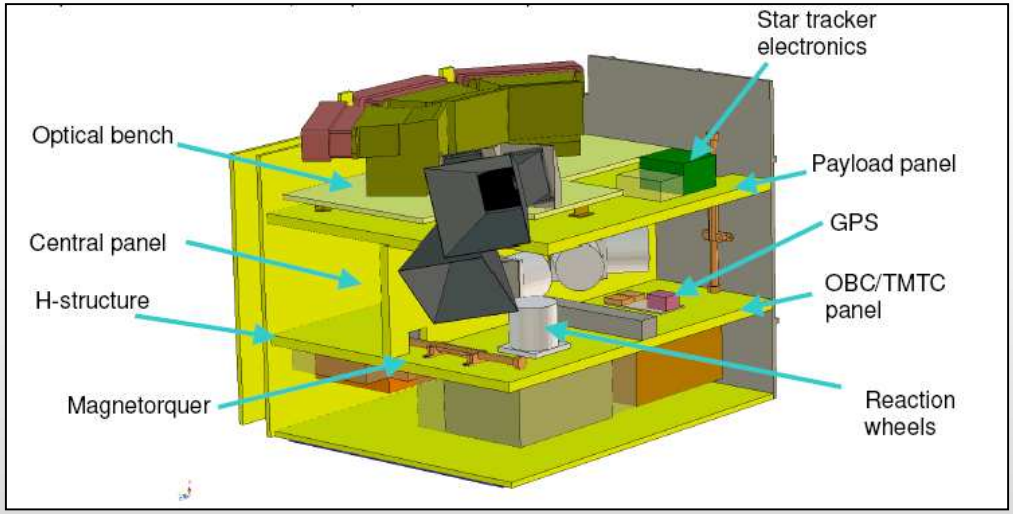
- Land use, land cover and its changes
- Vegetation behaviour in response to strong meteorological events (e.g. severe drought) and to climatic changes (long term behaviour of the vegetation)
- Disaster management (detection of fires and surface water bodies)
- biophysical parameters for models devoted to water budget and primary productivity (agriculture, ecosystem vulnerability, etc

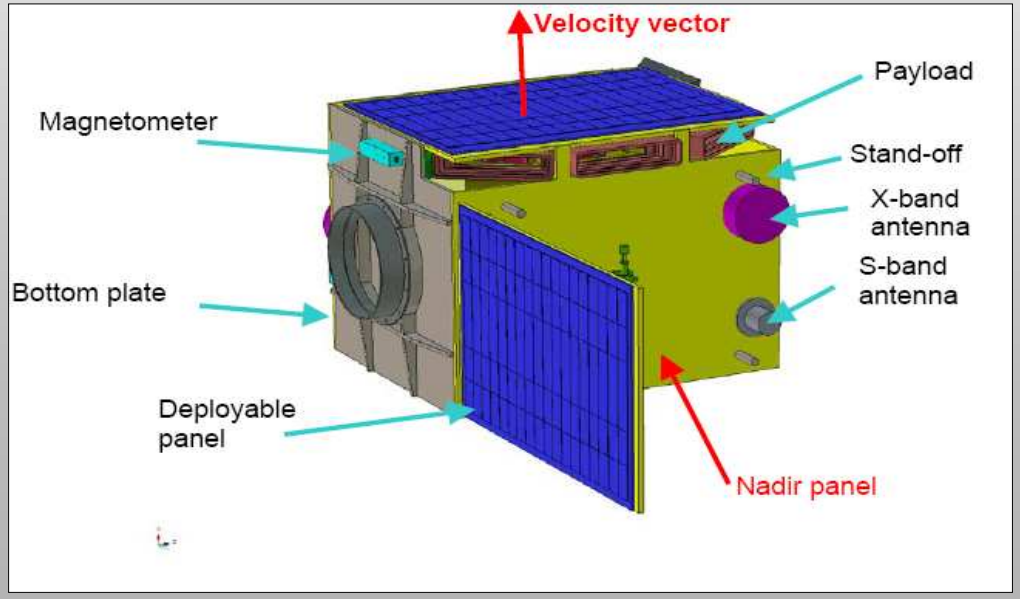
Spacecraft design

Spacecraft key figures

- **Total mass: 131 kg**
- **Peak power consumption: 131.2 W**
- **Thermal deformation:**
  inter-telescope < 0.5 arcsec
  star tracker-payload< 2 arcsec
- **Absolute geometric error**

	Centre pixels		Edge pixels	
Total error	Across track	Along track	Across track	Along track
Before calibration	102.5 m	89.5 m	332.3 m	89.5 m
After calibration	38.7 m	36.2 m	108.8 m	36.2 m
Requirement	100 m	100m	100 m	100 m



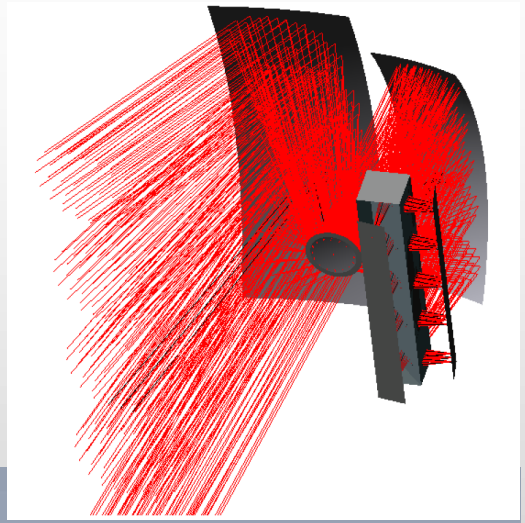


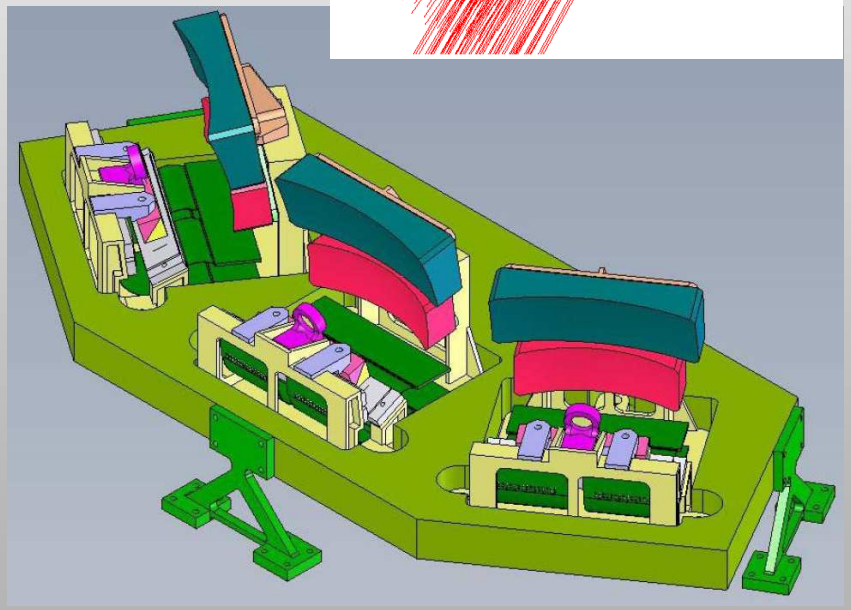
Instrument design

Performance

- Swath width = 2220 km at 800 km altitude
- VNIR GSD is 100 m in centre, 300 m at edge
- SWIR GSD is 200 m in centre, 600 m at edge
- Multi-spectral geometric accuracy < 0.03 pixels
- MTF at Nyquist ≥ 25% across-track and ≥ 11% along-track
- SNR at reference radiance :

Blue	Red	NIR	SWIR
188	376	454	1083





Design

- Composed of 3 identical TMA telescopes with 33.4°FOV each and 101.7°combined
- VNIR detector + SWIR detector µm

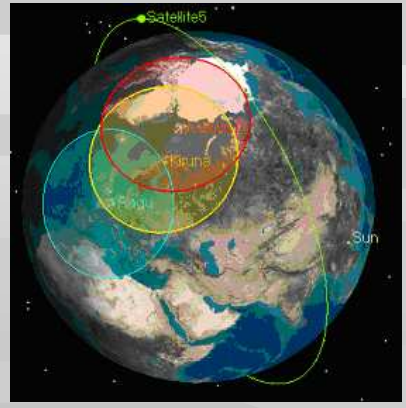
Ground segment

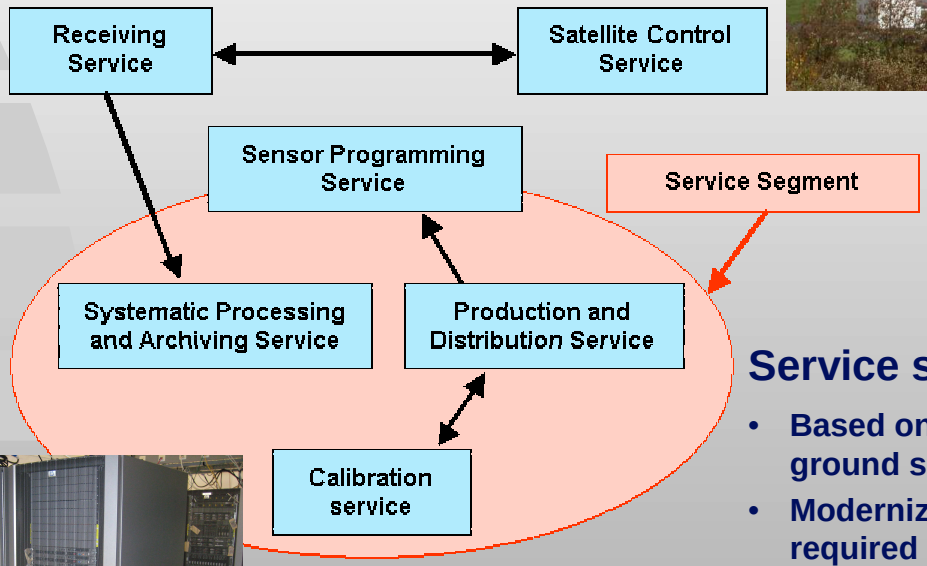
Receiving service segment

- Data downlink to Ushuaia/ Svalbard:
  X-band, 5.4 m antenna
- Downlink data rate = 17.44 Mbits/sec

Satellite Control Segment

- Spacecraft control from Redu (S-band uplink)





Service segment

- Based on SPOT-VEGETATION CTIV ground segment
- Modernization and standardization effort required
- Radiometric calibration using vicarious calibration during whole mission
- Geo-accuracy calibration using ground reference points during commissioning