



Výzkumný a zkušební letecký ústav, a. s.

VZLUSAT1

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Výzkumný a zkušební letecký ústav, a. s.

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VZLUSAT1 Evolution

2010 – First idea about IOD's onboard VZLU nanosatellite

2011 – Involvement VZLUSAT1 to QB50 project

2012 – Proposal for commercial IOD's








2013 – VZLUSAT1 Platform and Payloads Kickoff

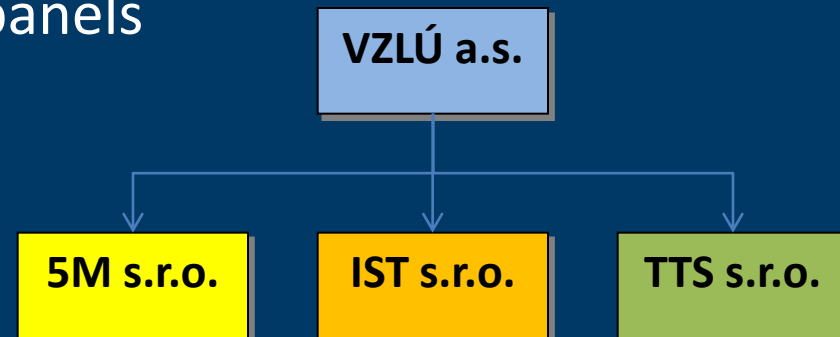
2014 – Proposal to IOD's extension



VZLUSAT1 mission objectives

TAČR ALFA 2013 – 2016 (TA03011329)





-   Radiation-resistant composite housing for electronics with increased thermal conductivity
-  Solar panel on composite substrate
-  Hollow retroreflector array based on composite
-  Environmental sensors
 - Temperature (PT1000)
 - Volatiles (HYT, HAL2)
 - Radiation (XRB diodes, CdTe)
-  Mechanism of deployable panels
-  Measuring electronics

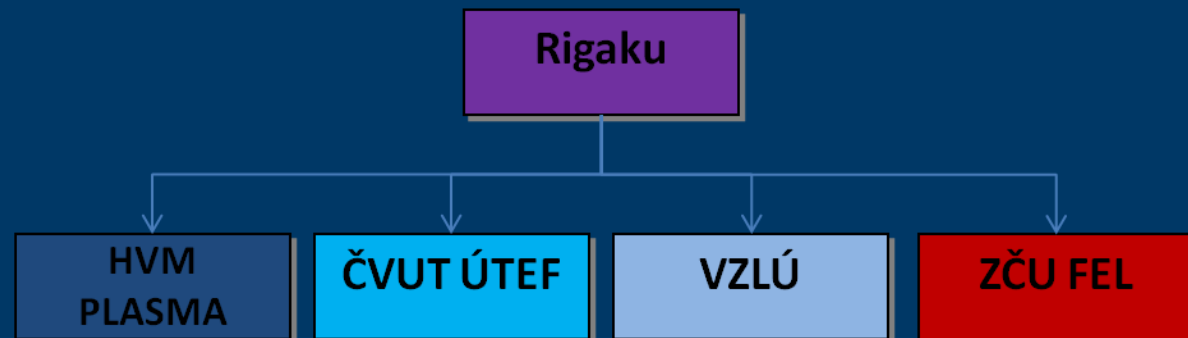




VZLUSAT1 mission objectives



















TAČR ALFA (Submitted 2014)

-  X-ray optics – Lobster eye
-  Lobster eye deployable mechanism
-  X-ray detector using pixel sensor Timepix
-  Ground segment



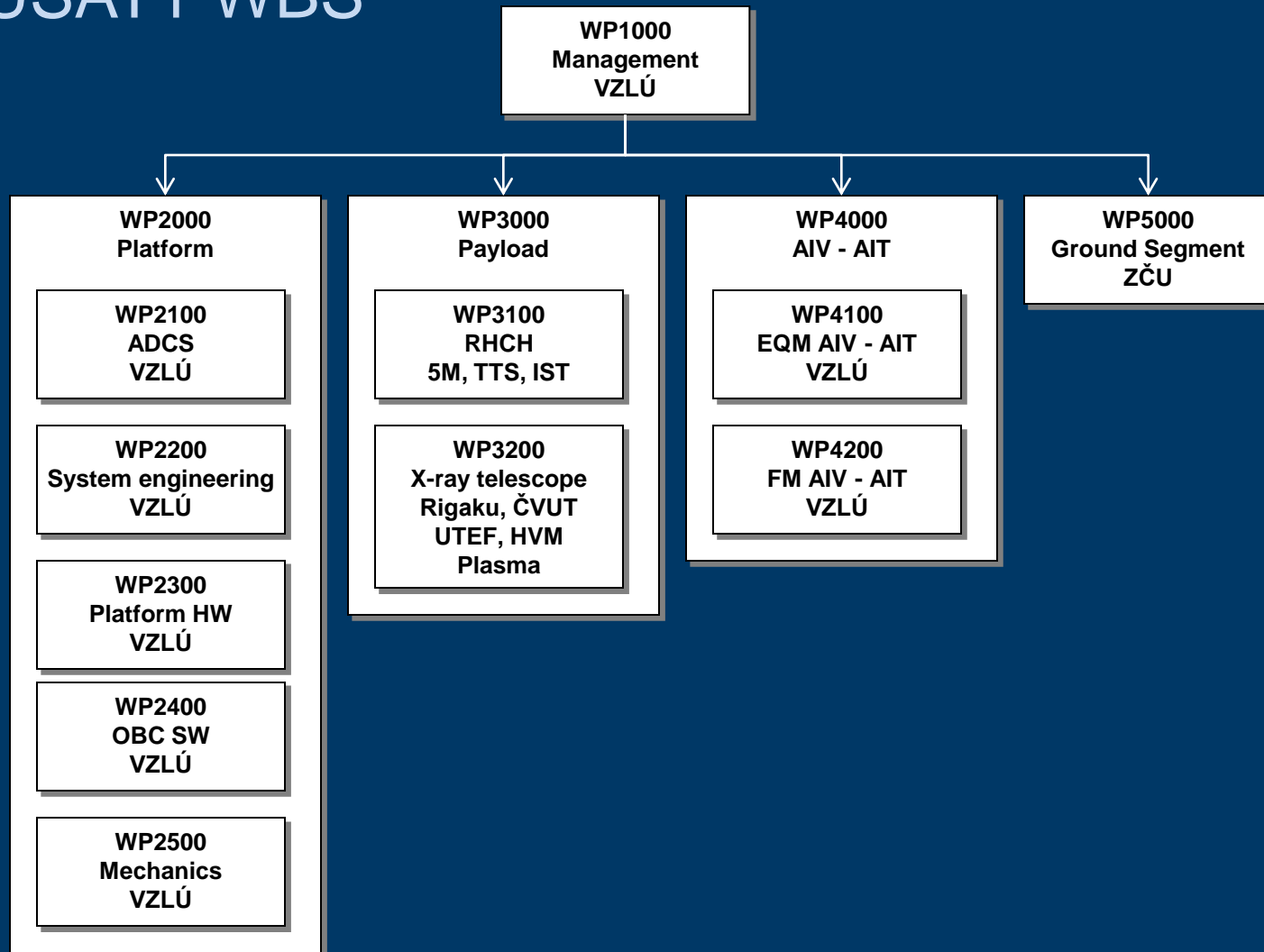


VZLUSAT1 Platform selection

	Space qualified ECSS	CubeSat COTS Commercial off-the-shelf	In-house
Production demands (time)			
Ease of SW integration			
Compatibility			
Reliability			
Marketability			
Price			

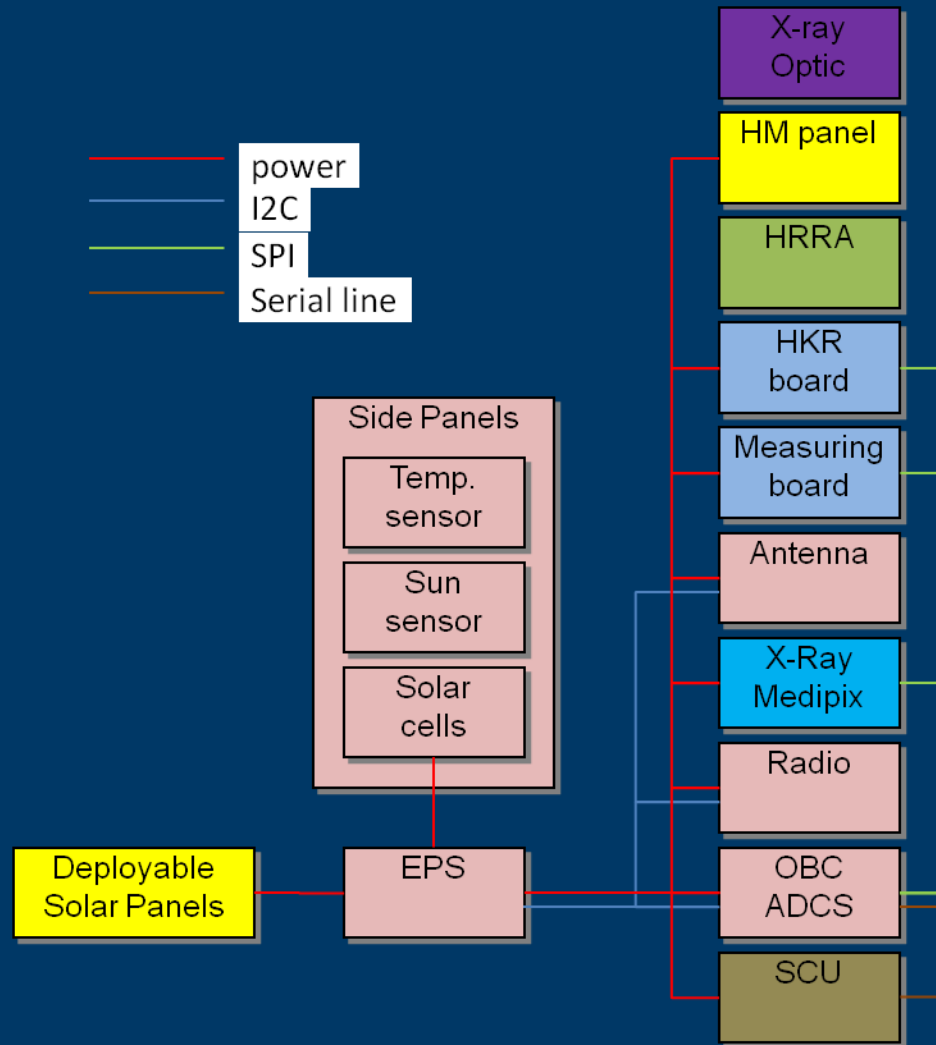


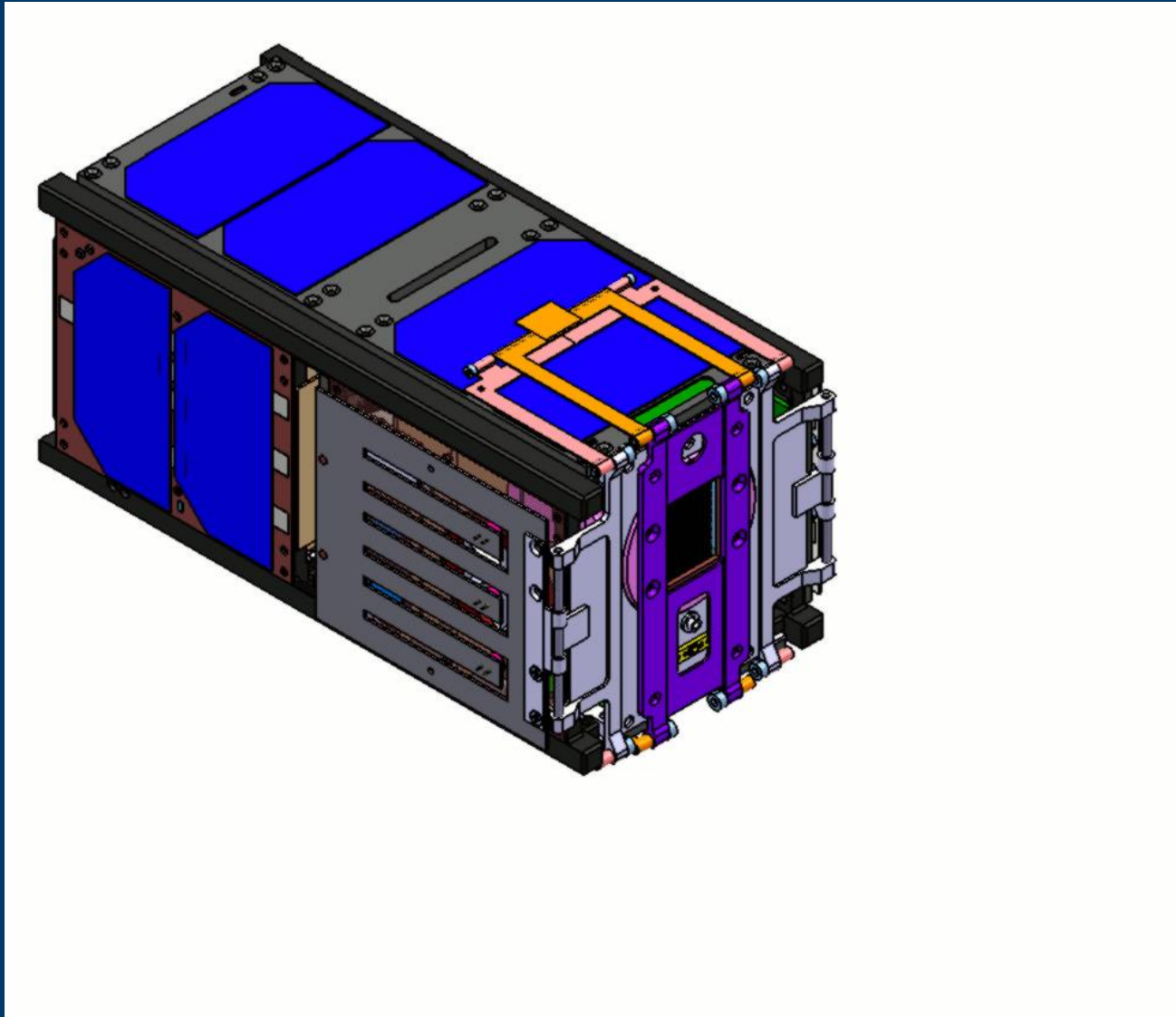
VZLUSAT1 WBS





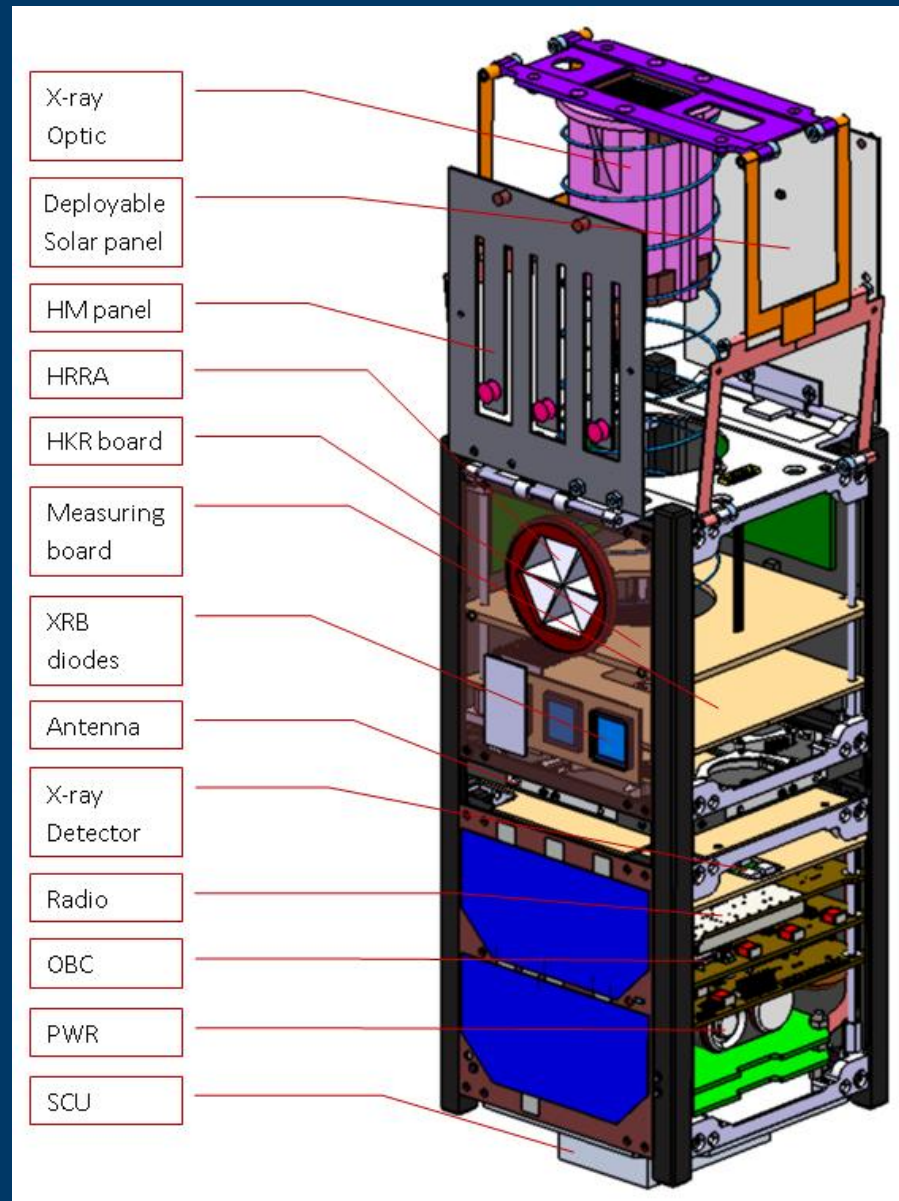
VZLUSAT1 System Configuration Diagram





Launch configuration and flight configuration

VZLUSAT1





VZLUSAT1 elements

Name	Description	Market ID	Provider	TRL
X-ray Optic	Lobster eye X-ray optics	in-house	Rigaku Czech	5
Deployable Solar panel	Solar panel deployed in orbit	in-house	5M	5
HM panel	Two Health Monitoring panels with piezo sensors	in-house	5M	3
HRRA	Hollow Retro Reflector Array on RHCH base	in-house	TTS	3
HKR	Heat Knife Resistor board for deploying mechanism	in-house	VZLU	5
Measuring board	Board for connecting measuring sensors	in-house	VZLU	3
XRb diodes	XRb diodes for measuring of radiation loads	in-house	VZLU	4
Volatiles	Volatiles sensor for measuring volatiles and H ₂ O in space environment	In-house	IST	5
Antenna	UHF Antenna	ANTS.REVC.073	ISIS	
X-ray Detector	Timepix detector	in-house	ČVUT ÚTEF	9
Radio	UHF Radio	NanoCom U482C	GomSpace	
OBC	On Board Computer	NanoMind A712D	GomSpace	
PWR	Power board	NanoMind A712B	GomSpace	
SCU	VKI Science Unite		VKI	



Summary

- The VZLUSAT1 project topic is an in orbit demonstrations (IOD's) of industrial products and technologies in Earth orbit. After completion of the project all products / technologies will have heritage from the mission and reach the higher technology readiness level.
- The CubeSat offers price effective solution to get your product/technology in the space.



Thank you for your attention