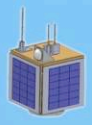
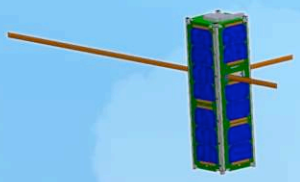
PSLV-C18

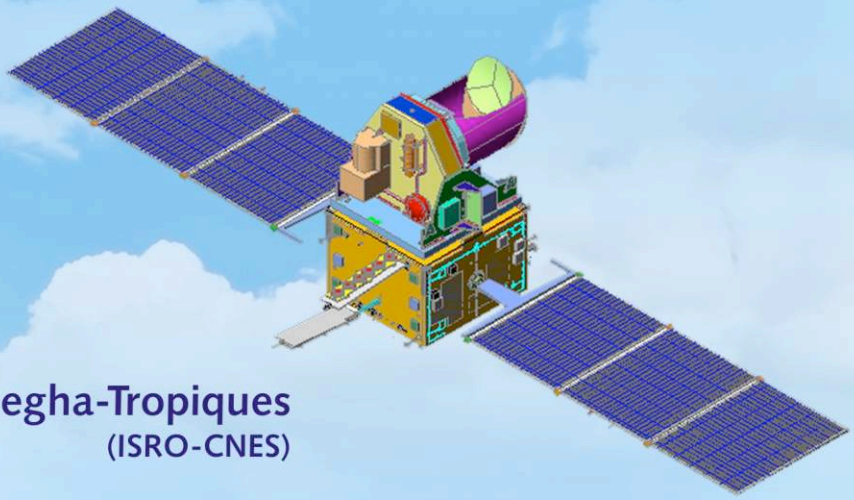
VesselSat-1
(Luxembourg)



SRMSat
(SRM University, Chennai)



Jugnu
(IIT, Kanpur)



Megha-Tropiques
(ISRO-CNES)

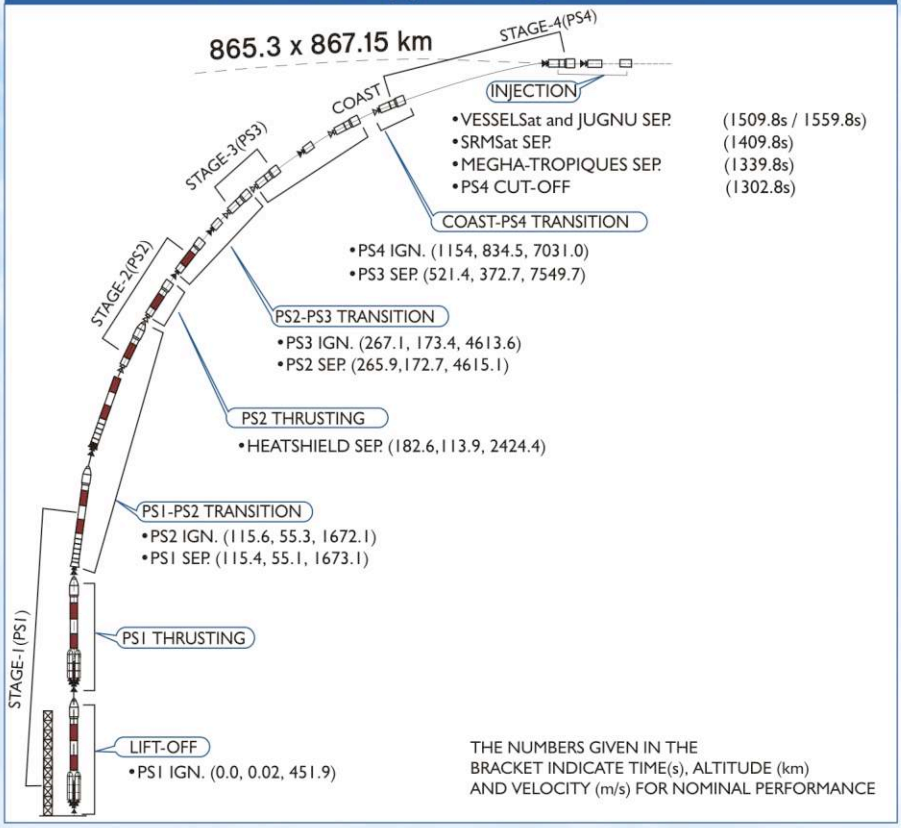
Megha-Tropiques / Jugnu / SRMSat / VesselSat-1

PSLV-C18

Polar Satellite Launch Vehicle, in its twentieth flight (PSLV-C18) will launch Megha-Tropiques satellite along with three auxiliary payloads with a total payload mass of 1047 kg from the first launch pad of Satish Dhawan Space Centre (SDSC SHAR). PSLV-C18 is the seventh flight of PSLV in 'core-alone' configuration i.e, without solid strap-on motors.

PSLV at First Launch Pad

PSLV-C18 Typical Flight Profile



PSLV-C18 Stages at a Glance

	STAGE-1	STAGE-2	STAGE-3	STAGE-4
Nomenclature	PS1	PS2	PS3	PS4
Propellant	Solid HTPB Based	Liquid UH25 and N_2O_4	Solid HTPB Based	Liquid MMH and MON-3
Propellant Mass (Tonne)	138.0	41.7	7.6	0.82
Max Thrust (kN)	4800	799	247	7.3x2
Burn Time (Sec)	100	148	108	163
Stage Dia (m)	2.8	2.8	2.0	2.8
Stage Length (m)	20	12.8	3.6	2.0
Control	•Secondary Injection Thrust Vector Control for Pitch & Yaw plane •Reaction Control Thrusters for Roll Control	• Engine Gimbal for Pitch & Yaw plane • Hot Gas Reaction Control System (RCS) for Roll Control	•Flex Nozzle for Pitch & Yaw plane •PS4 RCS for Roll Control	•Engine Gimbal for Pitch & Yaw plane •RCS for coast Phase Control

HTPB: Hydroxy Terminated Poly Butadiene
UH 25: Unsymmetrical di-methyl hydrazine & Hydrazine hydrate
MMH: Mono Methyl Hydrazine
MON: Mixed Oxides of Nitrogen

Megha-Tropiques

Megha-Tropiques is an Indo-French Joint Satellite Mission for studying the water cycle and energy exchanges in the tropics. The main objective of this mission is to understand the life cycle of convective systems that influence the tropical weather and climate and their role in associated energy and moisture budget of the atmosphere in tropical regions.

Megha-Tropiques will provide scientific data on the contribution of the water cycle to the tropical atmosphere, with information on condensed water in clouds, water vapour in the atmosphere, precipitation, and evaporation. With its circular orbit inclined 20 deg to the equator, the Megha-Tropiques is a unique satellite for climate research that should also aid scientists seeking to refine prediction models.

Megha-Tropiques Satellite under testing at SDSC SHAR

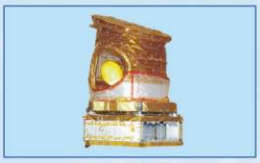
Megha-Tropiques Salient Features

Lift of Mass	1000 kg
Orbit	867 km with an inclination of 20 deg to the equator
Thermal	Passive system with IRS heritage
Power	1325 W (at End of Life)
	Two 24 AH NiCd batteries
TTC	S-band
AOCS	3-axis stabilised with 4 Reaction wheels, Gyros and Star sensors, Hydrazine based RCS
Solid State Recorder	16 Gb

Instruments

Megha-Tropiques carries the following four instruments:

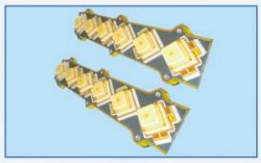
- Scanning Microwave Imager for Detection of Rain and Atmospheric Structures (MADRAS) developed jointly by CNES and ISRO
- Sounder for Probing Vertical Profiles of Humidity (SAPHIR) from CNES
- Scanner for Radiation Budget (ScaRaB) from CNES
- Radio Occultation Sensor for Vertical Profiling of Temperature and Humidity (ROSA), procured from Italy



MADRAS

SAPHIR

ScaRaB



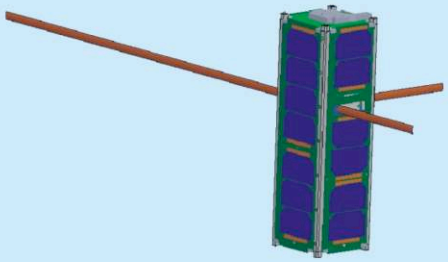
ROSA

Auxiliary Payloads of PSLV-C18

Besides Megha-Tropiques, PSLV-C18 carries three auxiliary payloads. Two of them – **Jugnu and SRMSat** – are from India, where as the third auxiliary payload – **VesselSat-1** – is from Luxembourg.

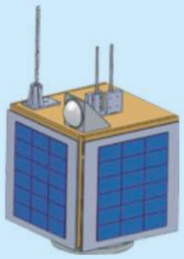
Jugnu

The nanosatellite Jugnu weighing 3 kg is designed and developed by Indian Institute of Technology, Kanpur under the guidance of ISRO. The satellite is intended to prove the indigenously developed camera system for imaging the Earth in the near infrared region and test image processing algorithms, to evaluate GPS receiver for its use in satellite navigation and to test indigenously developed MEMS based Inertial Measurement Unit (IMU) in space.



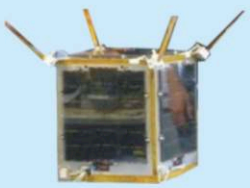
SRMSat

The nanosatellite SRMSat weighing 10.9 kg is developed by the students and faculty of SRM University attempts to address the problem of Global warming and pollution levels in the atmosphere by monitoring Carbon dioxide (CO_2) and water vapour (H_2O). The satellite uses a grating Spectrometer, which will observe absorption spectrum over a range of 900nm - 1700nm infrared range.



VesselSat-1

VesselSat-1 weighing 28.7 kg is a microsatellite developed and built by LuxSpace of Luxembourg. The satellite carries AIS (Automatic Identification System for ships) receivers to detect signals automatically transmitted by Vessels at sea in the region covered by the satellite footprint. The satellite carries two of such receivers, each with a dipole antenna composed of two 1.7m deployable elements.



Indian Space Research Organisation

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