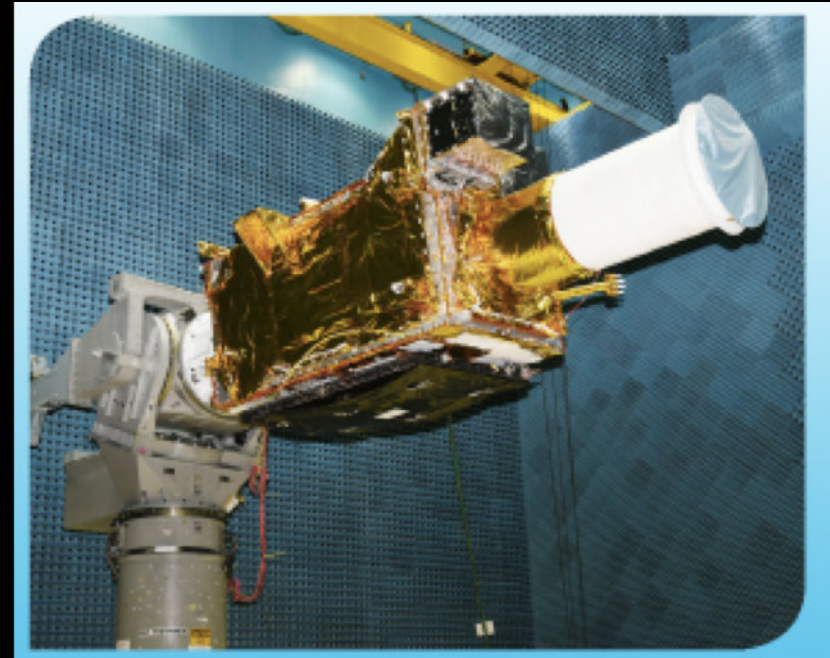




Geo Imaging Satellite-1 (GISAT-1) aka EOS-3



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GISAT-1

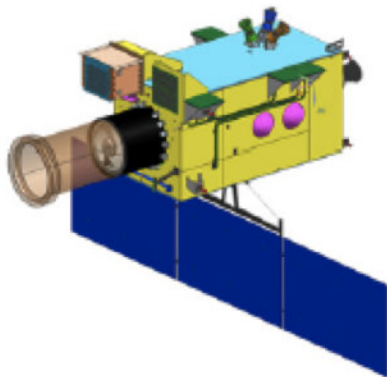
GISAT-1 is the first state-of-the-art agile Earth observation satellite from Geostationary orbit.

Objectives

- To provide near real time imaging of large area region of interest at frequent intervals
- For quick monitoring of natural disasters, episodic events and any short term events
- To obtain spectral signatures for agriculture, forestry, mineralogy, disaster warning, cloud properties, snow & glaciers and oceanography

The Satellite is configured around modified I-2k bus carrying multispectral and hyperspectral payloads in different bands with improved spatial and temporal resolution.

Deployed Spacecraft view



Stowed Spacecraft view



SALIENT FEATURES

Orbital slot	85.5° E	
Lift-off mass	2268 kg	
Power generation	2280 W	
Payload Imaging sensors	Spectral band	Resolution
	Multi-Spectral Visible & Near-InfraRed (6 bands)	42 m
	Hyper-Spectral Visible & Near-InfraRed (158 bands)	318 m
	Hyper-Spectral Short Wave-InfraRed (256 bands)	191 m



GISAT-1 Specifications

GISAT is first of its kind & unique geo-stationary imaging satellite for simultaneous and integrated observations of Land, Ocean and Atmosphere at relatively high resolution using hyper spectral technique.

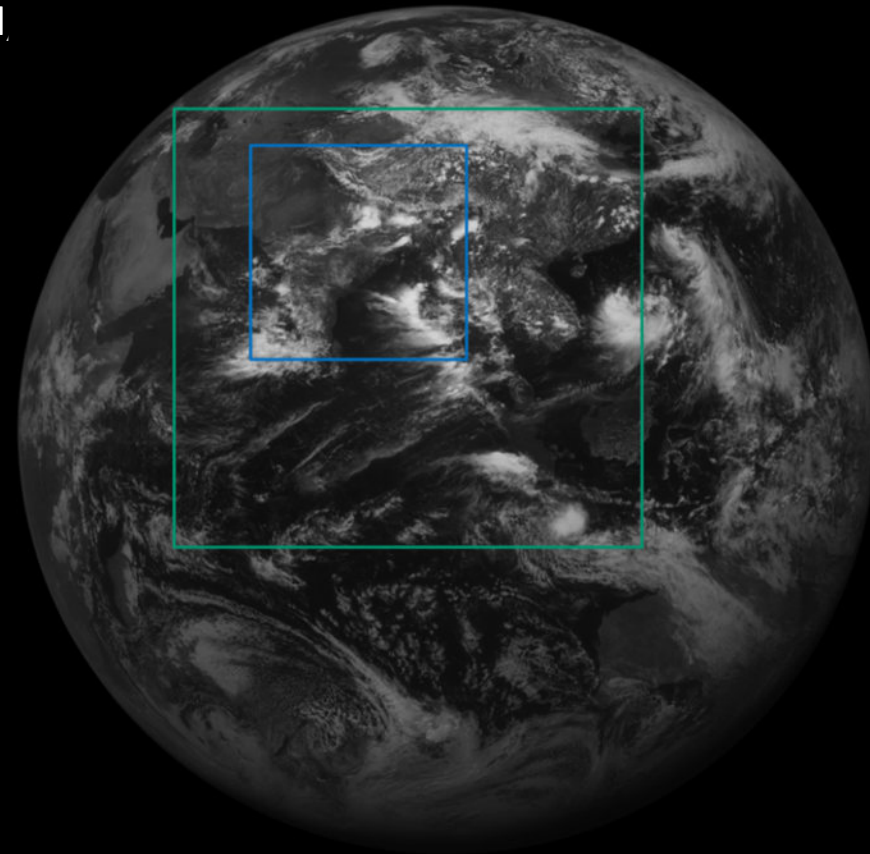
MX-VNIR: Multispectral - Visible Near Infrared,

HySI-VNIR: Hyperspectral Imager - Visible Near Infrared,

HySI-SWIR: Hyperspectral Imager - Short Wave Infrared,

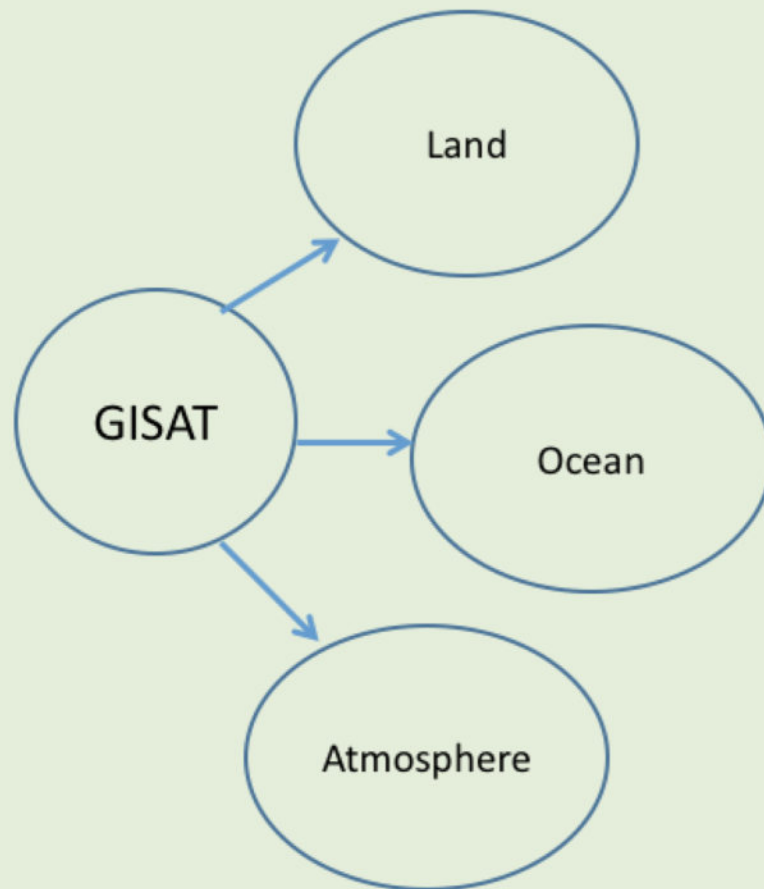
Band	#Ch	SNR	IFOV (m)	Range (μm)	Channels bandwidth (μm)
MX-VNIR	6	>200	42	0.45 - 0.875	B1: 0.45-0.52 B2: 0.52-0.59 B3: 0.62-0.68 B4: 0.77-0.86 B5N: 0.71-0.74 B6N: 0.845-0.875
HyS-VNIR	158	>400	320	0.375 - 1.0	$\Delta\lambda$: 4 nm
HyS-SWIR	256	>400	190	0.9 - 2.5	$\Delta\lambda$: 7 nm

GISAT



GISAT Payload Features

Sensors	Spectral Bands	Spectral Region (um)	Spatial Res. (m)	Swath (km)	Remarks
MX- VNIR	6	0.45 – 0.875	42	470	MX-Optical
HySI- VNIR	158	0.38 – 1.0	320	160	Hyperspectral (5 nm)
HySI- SWIR	256	0.90 – 2.5	191	190	Hyperspectral (10 nm)
MX-LWIR	6	7.1 – 13.5	1180	470	Thermal

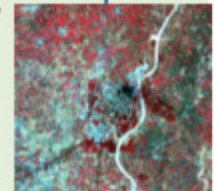


Biophysical Parameters:

NDVI, Albedo, Leaf Area Index, fAPAR, Land Surface Temp., Gross Primary Productivity

Applications:

Improved Crop Monitoring, Forest Mapping, Drought Assessment

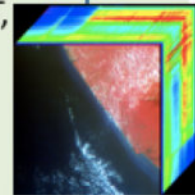


Ocean Optics:

Chlorophyll, Suspended Sediments, SST, PAR, Downwelling diffuse radiation.

Applications:

Fishery Forecast, Coastal Zone Management, Carbon Cycling in Ocean



Atmospheric Parameters:

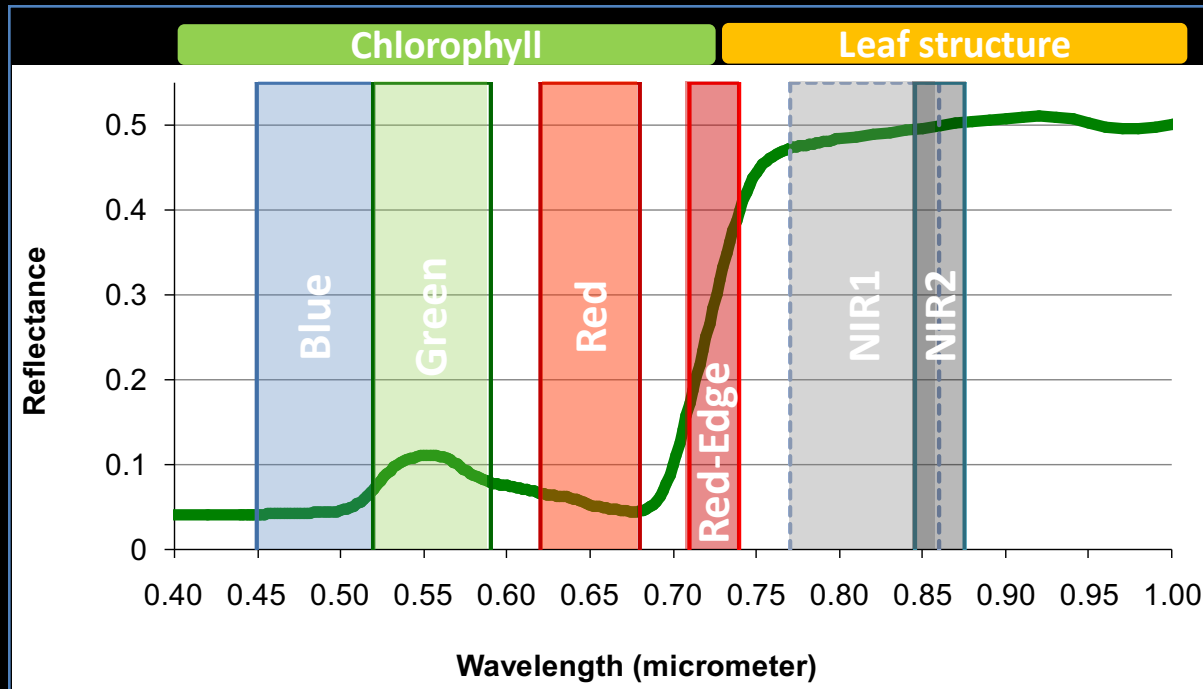
Aerosols, Water Vapour, Cloud Properties (Cloud top temp. height, fraction etc)

Applications:

Improved Weather forecast, Cyclone prediction, Dust storm and Fog Monitoring

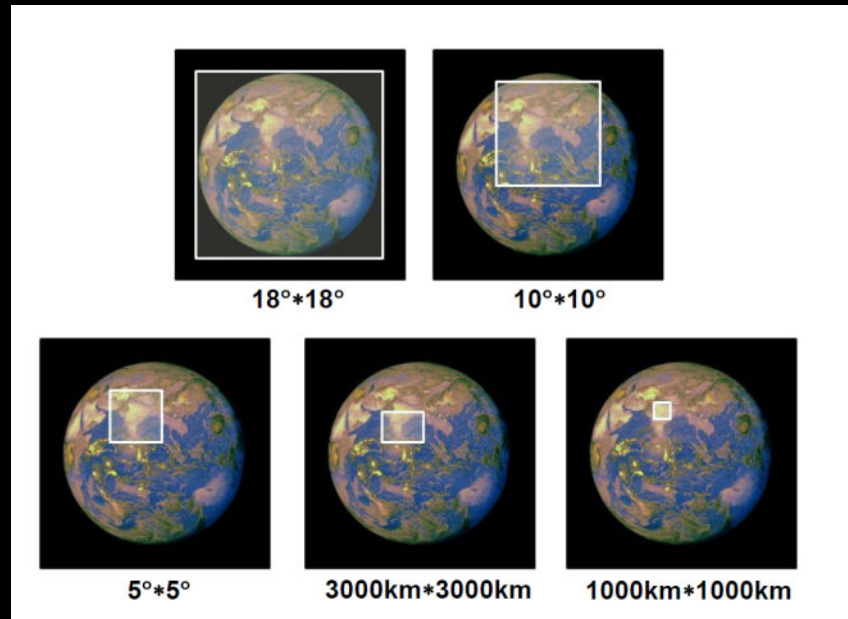


Spectral Channels for Terrestrial Applications: GISAT-MX



MX-VNIR Channels#	Designation	Spectral Channel Characteristics (μm)			Remarks
		λ_c	λ_{min}	λ_{max}	
1	B1	0.485	0.450	0.520	IRS Continuity
2	B2	0.555	0.520	0.590	IRS Continuity
3	B3	0.650	0.620	0.680	IRS Continuity
5	B4	0.815	0.770	0.860	IRS Continuity
4	B5N	0.725	0.710	0.740	New (Red Edge)
6	B6N	0.860	0.845	0.875	New (NIR2 WV free)

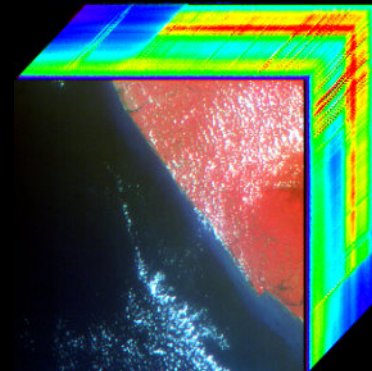
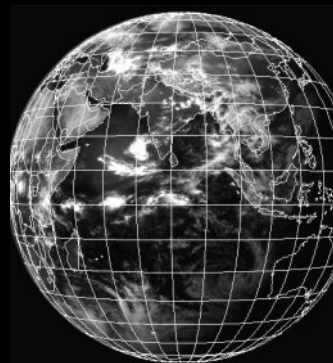
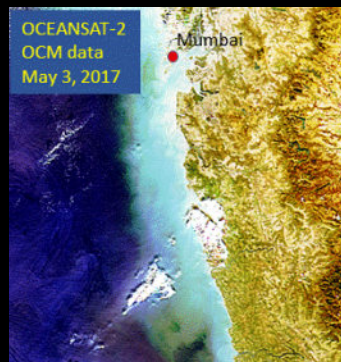
GISAT Scan modes



Coverage area (km ²)	Instrument	Scan rate (km/s)	Acquisition time (min.)	Data volume (Gb)
4000 * 4000	MX-VNIR	7.5	78	107.2
3000 * 3000	MX-VNIR	7.5	60	62.5
1000 * 3000	*MX VNIR+ Hys-VNIR	6.25	72	31.29+ 9.80
1000 * 1000	*MX VNIR+ Hys-VNIR+ Hys-SWIR	2.5	65	10.43+ 3.30+ 17.47

Uniqueness of GISAT with Other Indian EO Systems

Application	Satellite	Existing Specification	GISAT Specification	Remarks
Land	Resourcesat Series AWiFS	Spectral 4 Band Spat Res. 56 m	Spectral 6 Band Spat Res. 45 m	Red Edge and NIR2 Additional with Daily India Coverage
Ocean	Oceansat Series OCM	Spectral 8 Bands Spat Res. 360 m	Spectral 158 Spat Res. 320 m	Hyperspectral Experimental
Atmosphere	INSAT Series VHRR	Thermal 2 Bands Spat Res. 4 km	Thermal 6 Bands Spat Res. 1.5 km	High Resolution Pseudo sounder

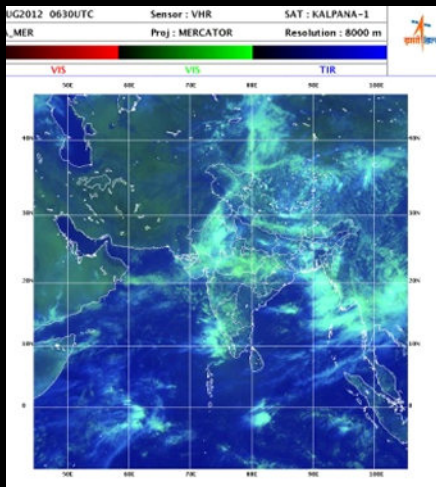




GISAT: Proposed data products



- Level-0 : RAW Data Products
- Level-1 : Navigatable Full Disk/AOI Products
- Level-1 : Map Projected Area based products
- Level-2 : Geophysical Parameter Products
- Level-3 : Time composited/Binned parameter based products
- Web products : Animated & Product thumbnails



Geophysical Product

1. Land products
2. Ocean products
3. Atmospheric products

Scheduled Launch : April 2021



But due to Pandemic situation launch is postponed

THANK YOU