

Oceansat-2

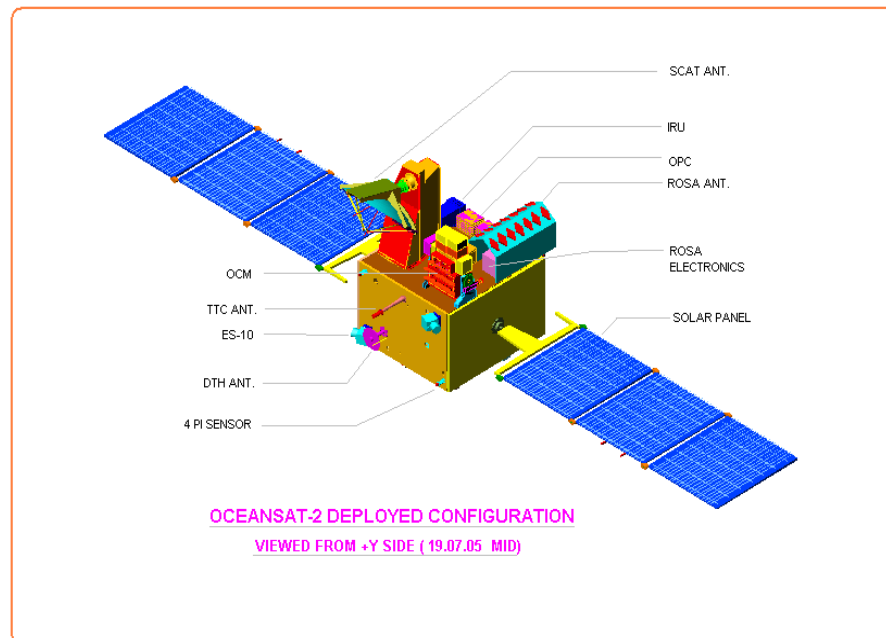
1. Heritage

The Oceansat-1(IRS-P4) launched in May 1999 was the first dedicated mission for oceanic and atmospheric studies. Two payloads, namely, Ocean Colour Monitor (OCM) and Multi-frequency Microwave Radiometer (MSMR) were flown on board IRS-P4.

The oceansat-2 mission is envisaged as the continuity mission to the Oceansat-1 data users.

2. Oceansat-2 mission overview

- Launch Vehicle PSLV – C-14
- Launched on 23-09-2009 at 11-51 IST
- Spacecraft Lift-off mass 958 Kg
- OCEANSAT-2 has the following three payloads
 1. 8-band Ocean Color Monitor (OCM)
 2. Ku-Band Pencil beam Scatterometer
 3. Radio Occultation Sounder for Atmospheric studies (ROSA) - Developed by Italian Space Agency (ASI)



Ocean Colour Monitor (OCM)

The OCM is an 8-band multi-spectral camera operating in the visible-Near IR spectral range. This camera provides an instantaneous Geometric Field of View of 360 m covering a swath of 1420 Km. This wide swath enables the OCM to provide a repetivity of two days for any given area. To avoid sun glint due to specular reflection from ocean surface, there is provision to tilt the OCM camera by +20 deg in the along the track direction.

- IGFOV : 360 m
- GSD : 236 m
- Swath : 1420 Km
- Spectral Bands
 - Band-1 : 402 - 422
 - Band-2 : 433 - 453
 - Band-3 : 480 - 500
 - Band-4 : 500 - 520
 - Band-5 : 545 - 565
 - Band-6 : 610 - 630
 - Band-7 : 725 - 755
 - Band-8 : 845 - 885
- Quantisation : 12 Bits
- SNR : > 512

3. Oceansat-2 downlink specifications:

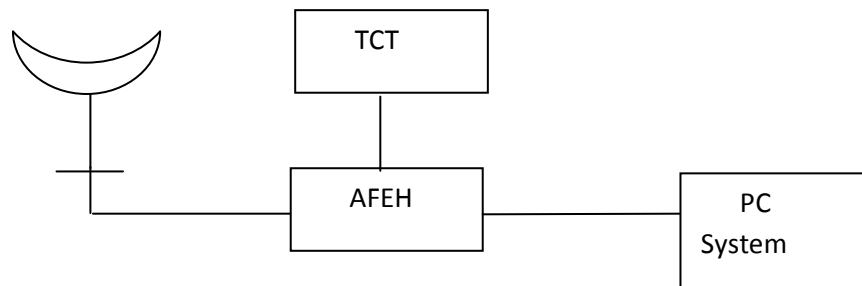
	Oceansat-2	Oceansat-1
Frequency MHz	8300	8250
Data Rate MBPS	42.4515	20.8
Modulation	QPSK	QPSK
Satellite Altitude km	726	720
Slant Range (5° EL) km	2623	2609
Satellite EIRP dBw	13.8	16.5
Propagation Loss dB	-179.15	-179.16
Miscellaneous losses (0.4+0.3+1.0) dB (Pointing +Pol. Mismatch+Atm. losses)	-1.7	-2.0
Receive System G/T dB/°K	31.5	30.5
Boltzmann const (K) dBw	-228.6	-228.6
Receive C/No. dB-Hz	93.08	94.43
Log of data rate dB	76.28	73.2
Eb/No available dB	16.80	21.24
Eb/No required dB	10.8	10.8
Implementation Margin dB	2.0	2.0
System margin dB	4.0	8.4

Oceansat-2 downlinks in I and Q channels each of 21.4515. Bitsync demod should be of 42.4515 Mbps capability.

4. Ground Station Requirements for downlink & processing:

The X-band ground station requires the following systems for receiving Oceansat-2.

- 4.1. Reception Station: Standard X-band Antenna system of 3.6m or above diameter upto Bitsync/demod.
- 4.2. Data clock of bitsync is fed to Antrix proprietary AFEH. The output of AFEH is then to fed to the PC system. The block diagram is as below:



Block diagram of Reception Chain

4.3. Antrix Proprietary:

Software:

- Acquire package
- Data processing software

Hardware:

- Advanced Front End Hardware(AFEH)

4.4. P. C. System:

- Standard P.C./Server with RHEL 5.1 or above with Intel C Compiler

4.5. COTS H/W and S/W

- TCT with IRIG-A output (Antrix can supply)

5. OCM Products

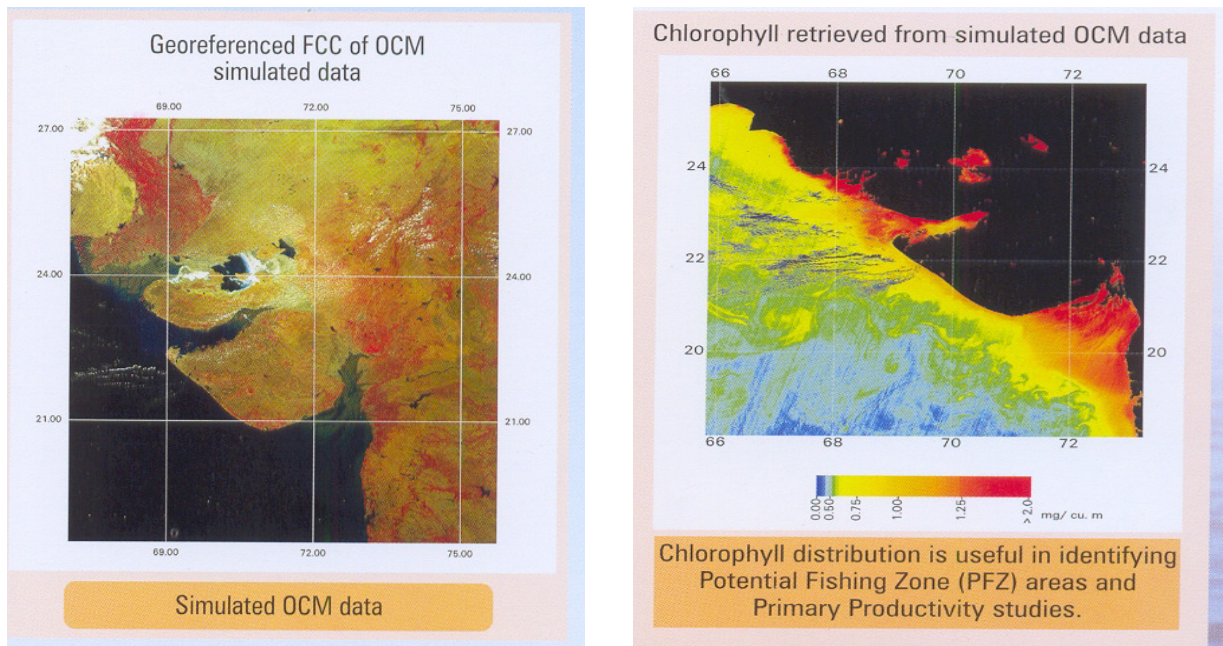
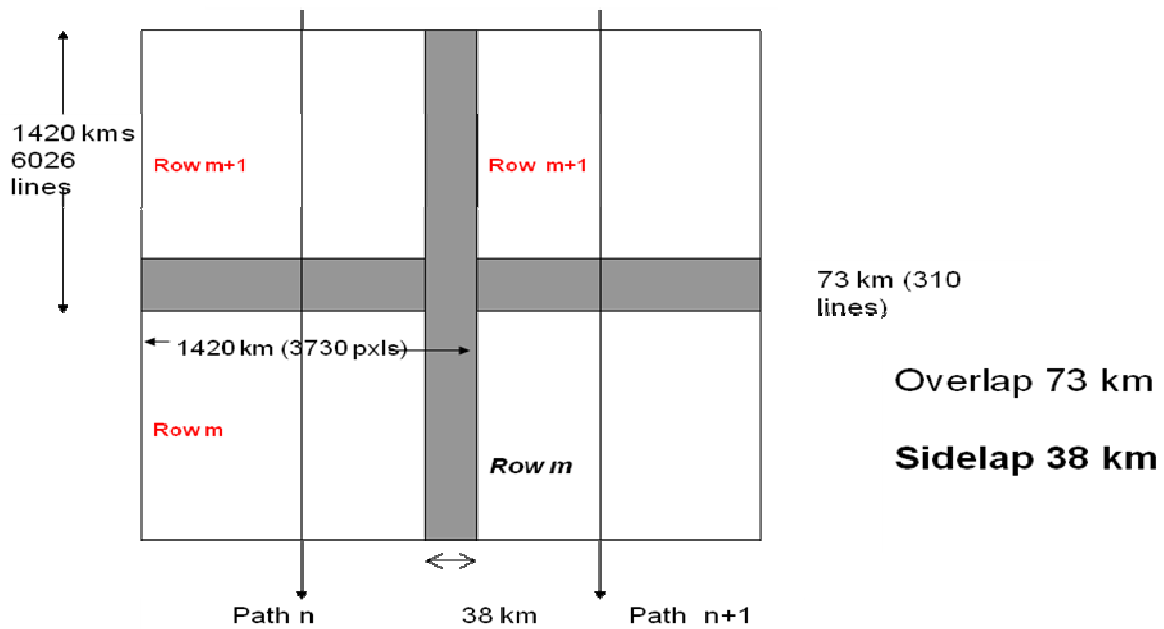


FIG-5 : OCM SCENE LAYOUT



- Local Area Coverage (LAC) - scene based products
 - 360m X 236m Resolution

- Global Area Coverage (GAC)- Strip based products (4km x 4km) for -70 to + 70 deg
 - Data recorded is 1 km x 1 km resolution
- ON-BOARD Calibration using LEDs operated during night passes
- Moon Calibration

5.1. Geometric Accuracy

- Geometrically corrected scene based products will have a location accuracy < +/- 3 Km
- Internal Distortion < +/- 2 pixels
- Band-to-Band registration < +/- 0.25 pixels

5.2. OCM-II Data Products

Types LEVEL-1 Radiance Product

- LEVEL-2 Geometrically corrected
- LEVEL-3 Geometrically corrected Special Products
 - 3A : Single Scene Product
 - 3B : Binned Product

Sl. No.	Product type	Level	Aligned	Format Supported
1	Standard Product	Level-1	Path	HDF, LGSOWG
2	Geo-referenced	Level-2	North	HDF, LGSOWG
3	Special Products	Level-3	North	HDF

Special Products (TBD for International users)

- Chlorophyll Concentration Product
- Yellow Substance Concentration Product
- Total Suspended Sediment Concentration Product
- Atmospheric corrected Product

- Normalized water leaving radiances in Band-1 to Band-6
- NDVI using band 6 and band 8
- Aerosol Optical Depth at 865 nm
- Diffused Attenuation Coefficients (K-490nm)

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