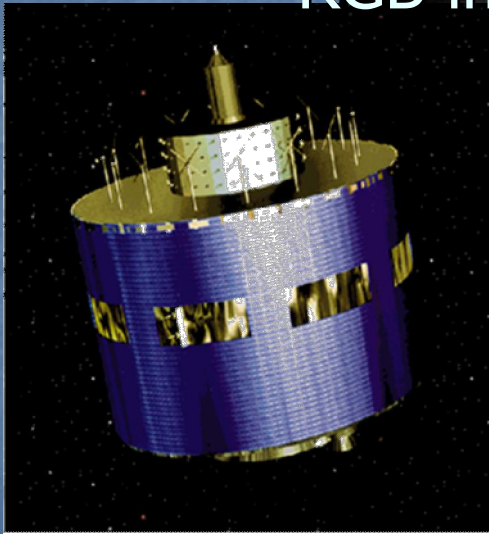


The Basis of RGB image composites



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First, this presentation will show the basic, general knowledge of satellite imagery of each channels.

Thereafter, this presentation will show RGB image composites.

Objectives

- Learn the basic, general knowledge of satellite imagery of each channels.
- Especially, we learn the characteristics of the sensors onboard MTSAT-1R.
- Learn how to use (interpret) the differences.
- Learn RGB image composites.
- This material shows you the RGB composite examples applied the technique of RGB to MTSAT images.

MTSAT-1R Channels

Satellite	MTSAT-1R	
Imager	JAMI	
Operation (West Pacific)	28 Jun. 2005 to present	
Geo. position	140 E	
Raw Data Format	HRIT	
Number of channels	5	
Band	Wavelength (μm)	Accuracy
VIS (Visible)	0.55 – 0.90	6.5SNR@2.5%
IR1 (IR window 1)	10.3 – 11.3	0.18@300K
IR2 (IR window 2)	11.5 – 12.5	0.18@300K
IR3 (WV)	6.5 – 7.0	0.15@300K
IR4 (SWIR)	3.5 – 4.0	0.18@300K
Spatial resolution at nadir	VIS: 1 km IR1–4: 4 km	
Num. of quantization levels	VIS: 1024 IR: 1024	
Observing frequency (times/day)	Full disk: 24 Half disk: 24 (N.H.) 8 (S.H.)	

We will mention the feature of individual JAMI channels, before reference of RGB composite image.

Resolution

The characteristics of a sensor on board the MTSAT-1R are shown in Table. The horizontal spatial resolution of the MTSAT-1R is 1 km in the VIS image and 4 km in the IR images at the sub-satellite point (SSP). The more distant from SSP, the more the earth's surface is viewed obliquely and the resolution deteriorates. In the vicinity of Japan, the resolution is 1.4 km in the VIS image and 5 km in the IR images.

The gray scale of MTSAT-1R images is 10 bits (1024 levels) in the VIS and IR images.

MSG Channels

Channel No.	Spectral Band (μm)	Characteristics of Spectral Band (μm)			Main Observational Application
		Centre	Min	Max	
1	VIS 0.6	0.635	0.56	0.71	Surface, clouds, wind fields
2	VIS 0.8	0.81	0.74	0.88	Surface, clouds, wind fields
3	NIR 1.6	1.64	1.50	1.78	Surface, cloud phase
4	IR 3.9	3.90	3.48	4.36	Surface, clouds, wind fields
5	WV 6.2	6.25	5.35	7.15	Water vapor, high level clouds, atmospheric instability
6	WV 7.3	7.35	6.85	7.85	Water vapor, atmospheric instability
7	IR 8.7	8.70	8.30	9.10	Surface, clouds, atmospheric instability
8	IR 9.7	9.66	9.38	9.94	Ozone
9	IR 10.8	10.80	9.80	11.80	Surface, clouds, wind fields, atmospheric instability
10	IR 12.0	12.00	11.00	13.00	Surface, clouds, atmospheric instability
11	IR 13.4	13.40	12.40	14.40	Cirrus cloud height, atmospheric instability
12	HRV	Broadband (about 0.4 – 1.1 μm)			Surface, clouds

Spectral channel characteristics of SEVIRI in terms of central, minimum and maximum wavelength of the channels and the main application areas of each channel.

This table shows MSG (METEOSAT Second Generation) channels.

MSG and MTSAT-1R

MTSAT Channels	Wave length (μm)	MSG Channels	Wave length (μm)
VIS	0.55~0.90	VIS0.6	0.56~0.71
IR1	10.3~11.3	IR10.8	9.80~11.80
IR2	11.5~12.5	IR12.0	11.00~13.00
IR3(WV)	6.5~7.0	WV6.2	5.35~7.15
IR4(3.8 μm)	3.5~4.0	IR3.9	3.48~4.36

This table shows the correspondence of each channel of MSG and MTSAT-1R.

There are many common things on the image interpretation in the corresponding channels.