International Civil Aviation Organization

NINTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP OF APANPIRG (CNS/MET SG/9)

Bangkok, Thailand, 11–15 July 2005

Agenda Item 10: ICAO Warning Systems

A NEW METEOROLOGICAL SATELITTE MTSAT-1R IS FULLY OPERATIONAL

(Presented by Japan)

SUMMARY

This paper presents that the meteorological payload of MTSAT-1R has been in operation since 28 June 2005 with some new progress that will have good impact on MET support for aviation such as the detection of volcanic ash.

1. Introduction

1.1 The Meteorological payload of new Japanese geostationary satellite MTSAT-1R (Multi-functional Transport Satellite) has been in operation since 28 June 2005. The MTSAT-1R is the follow-on satellite of GMS-5 that has been backed up by GOES-9 of NOAA/NESDIS from May 2003 through 14 July 2005, and will cover the East Asia and the Western Pacific region for five years. MTSAT-1R provides cloud imagery for the Northern Hemisphere every 30 minutes, halving the previous hourly rate, to more intensively monitor typhoon and cloud movement. The satellite deploys a new high-resolution imager including a new infrared channel (IR4) that can detect low-level cloud/fog areas at night as well as volcanic ash clouds. The imager has enhanced brightness levels, enabling a never before level of quality in imagery.

2. New procedures of MTSAT-1R

2.1 Details of the new progress of MTSAT-1R are shown in Attachment A.

3. Action by the meeting

3.1 The meeting is invited to note the issues presented above.

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MTSAT-1R

The new geostationary meteorological satellite of Japan

Launched on
26 February 2005

Its meteorological payload
has been fully operational
since 28 June 2005

MTSAT-1R

The Multi-functional Transport Satellite

- Fulfills two missions:
  a meteorological mission by the JMA and
  an aviation control mission by the JCAB

- Succeeds the GMS-5, covering East Asia and the Western Pacific (as the sixth geostationary meteorological satellite of Japan)

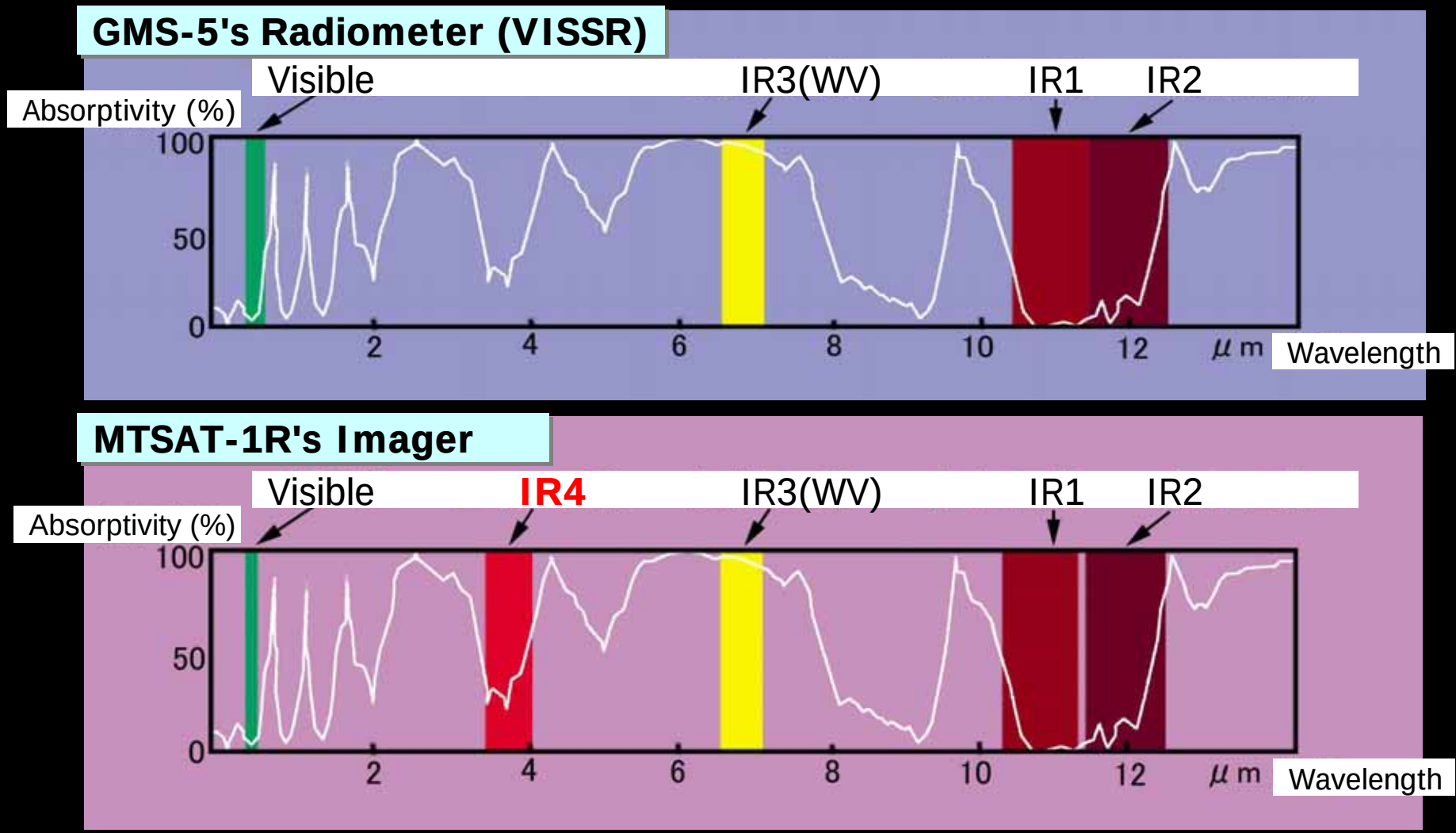
- Deploys a new high-resolution imager which
  - ✓ Provides imagery for the Northern Hemisphere every 30 min
  - ✓ Detects low-level cloud/fog at night

- Enables closer monitoring of torrential downpour, typhoon & fog, for preventing natural hazard, e.g. flood damage & distress

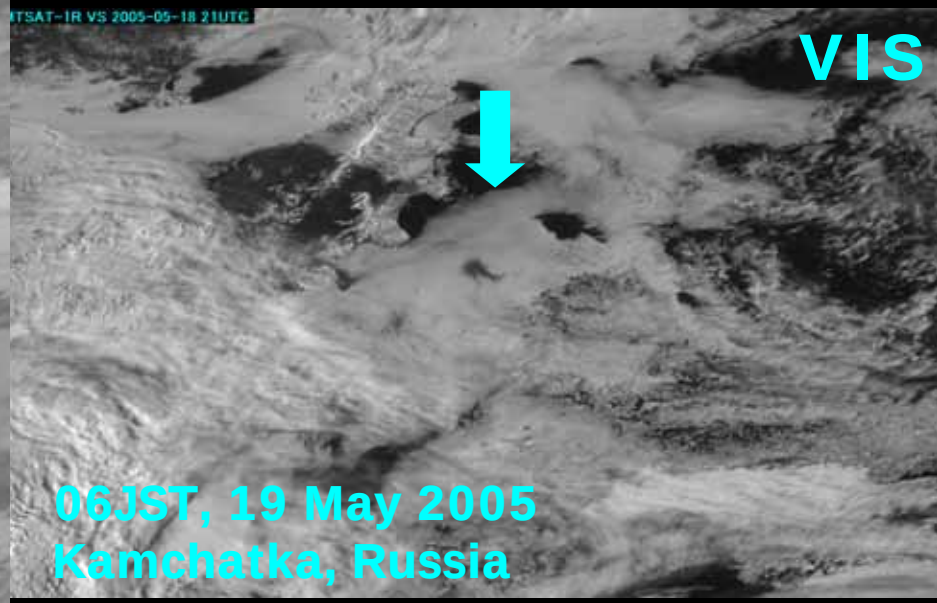
Specification of MTSAT-1R

	MTSAT-1R	GMS-5
Weight (Beginning of Life)	1,770kg	345kg
Length	33m	3m
Attitude Control	3-axis	Spin (passive)
Design Life	5 years (10 years for aeronautical mission)	5 years
Imaging Channels	1 visible, 4 IR	1 visible, 3 IR
Resolution	VIS 1km IR 4km	VIS 1.25km IR 5km
Brightness level	1024	VIS 64, IR 256
Observation	Full disk: hourly N Hemi.: hourly (about 30 min after full disk)	Full disk: hourly

Infrared absorptivity of the Earth's atmosphere and MTSAT-1R's imaging channel allocation



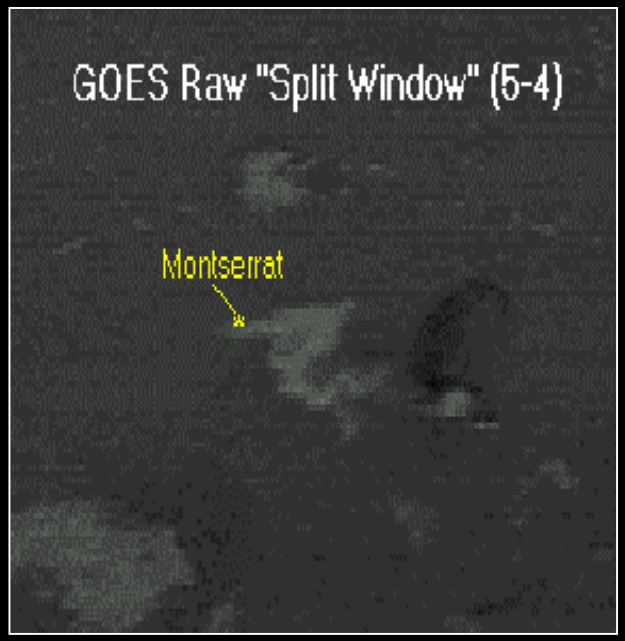
MTSAT-1R's new IR4 channel detects low level cloud / fog at night

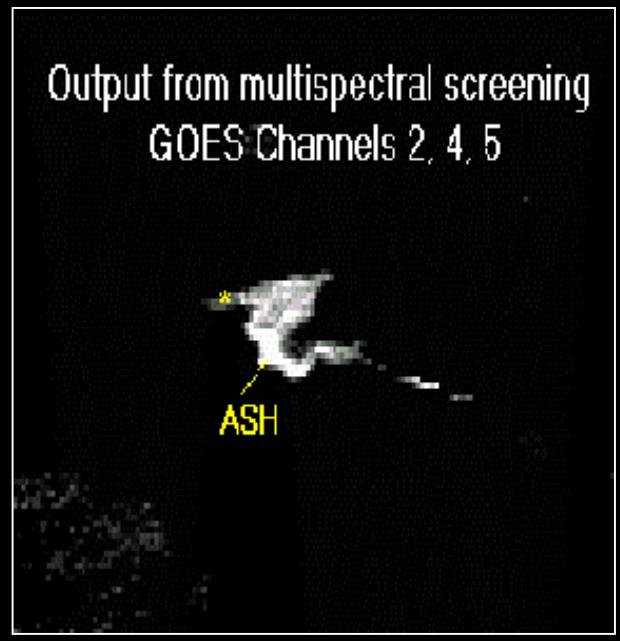


The boundary of fog near Kamchatka is clear in IR4 channel at night, while not in the existing IR1 ch

Improvement of Detection of Volcanic Ash Cloud using Short wavelength Infrared Image

Short wavelength infrared image from MTSAT-1R is expected to enable the similar improvement as below.





Split Window (left) and the combined image of original and short wavelength infrared images (right) of the GOES satellite. The volcanic ash cloud of Soufriere hills volcano eruption on November 6, 1997 was detected clearer on the latter. (from Gary P. Ellrod (NOAA/NESDIS) et al., 1999).