Ministry of Earth Sciences
Earth System Science Organisation
National Centre for Medium Range Weather Forecasting

Real-time use of Atmospheric Sounding data at NCMRWF: Current and Future Plans

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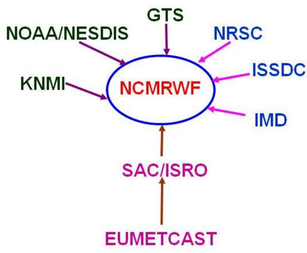
NCMRWF is a pioneer NWP Research Centre in India, and has been assimilating the real-time TOVS data operationally in its Global models along with other conventional data sets since its inception. NCMRWF made special arrangements to receive ATOVS level 1b data directly from NOAA/NESDIS and started assimilating cloud cleared radiance data in the place of retrieved temperature and humidity profiles since 2007. To achieve timeliness of data availability, India has been making efforts to join Asia-Pacific Regional ATOVS Re-transmission data (RARS) group and also getting EARS (European RARS) through Eumetcast. It is found that India Meteorological Department's (IMD) Chennai and Delhi HRPT stations are very useful in filling data void regions in Asia-pacific RARS.

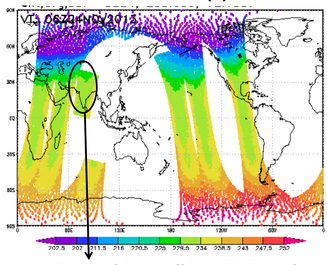
Reception of Satellite Data



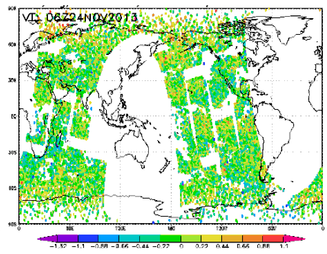
ATOVS and Hyperspectral Radiance assimilated in NCMRWF models : Current Status

Instrument	Satellites
AMSUA	NOAA-15,16,18,19 Metop-A, B
AMSUB	NOAA-16, 17
MHS	NOAA-18, 19 Metop-A, B
HIRS-3	NOAA-16, 17
HIRS-4	NOAA-18 Metop-A, B
IASI	Metop-A ,B
AIRS	AQUA
Geostationary Sounder	GOES-13 , 15
GPSRO	COSMIC, CHAMP

Metop-A: AMSUA Ch-12
24-11-2013 06 UTC
Observed BT (K)

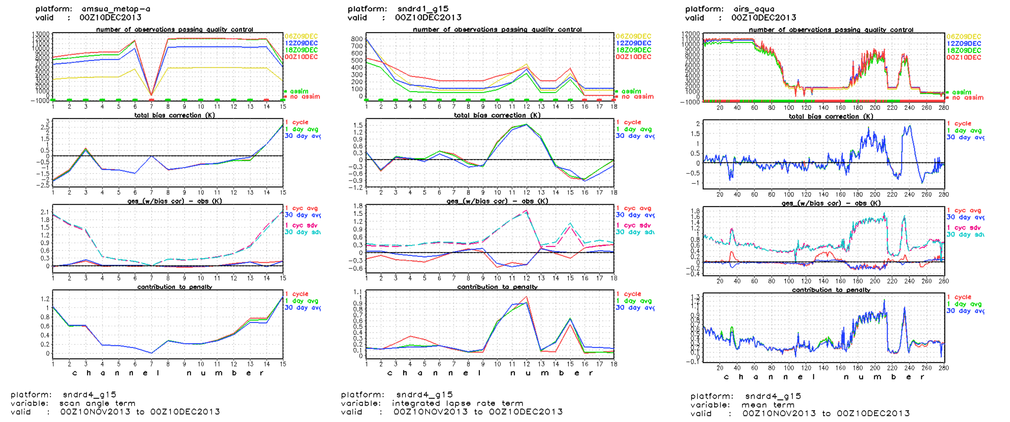


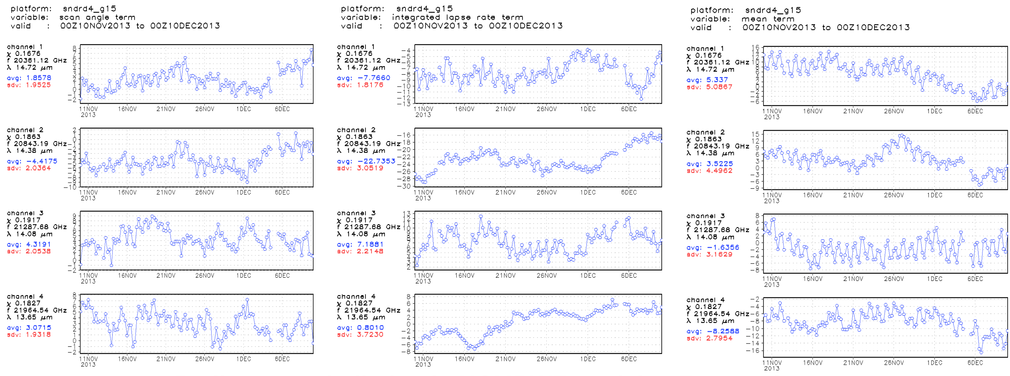
Metop-A: IASI Ch-219
24-11-2013 06 UTC Guess
(with Bias Corr.) – Obs (BT K)



RARS from Indian HRPT stations

Real-time monitoring of ATOVS and Hyperspectral Radiance

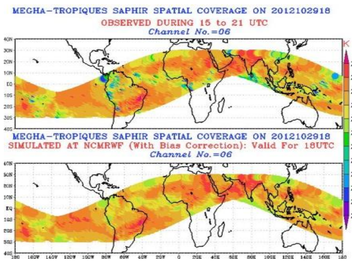




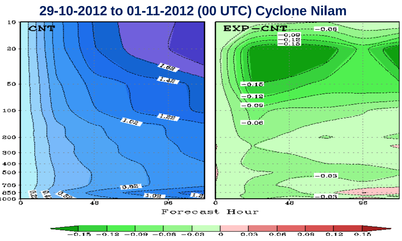
Radiance assimilation in NCMRWF models : Future plans

1. Humidity sounder –SAPHIR onboard Megha-Tropiques (Assimilation Experiments going on)
2. Sounder and Imager radiance from India's latest geostationary satellite INSAT-3D (validation and simulation going on)
3. Suomi-NPP CrIS and ATMS: Recently NCMRWF has got access to the Suomi-NPP (Code changes has been made to assimilate the data)

Megha-Tropiques (MT) SAPHIR:Simulation and Assimilation



RMSE in Temperature over Tropics
29-10-2012 to 01-11-2012 (00 UTC) Cyclone Nilam

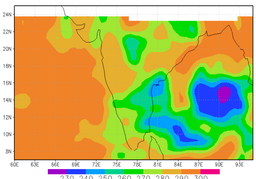


SAPHIR data assimilation in NCMRWF global forecast system shows positive impact, particularly over the Tropics.

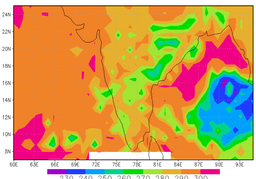
INSAT-3D radiance simulation and validation

Along with other sounders onboard polar satellites, INSAT-3D provides high resolution vertical profiles over the India and surrounding oceanic regions. Simulation of INSAT-3D imager (6-channels) and sounder (18-channels IR) radiances using radiative transfer (RT) and NWP models are going on at NCMRWF. Development work for assimilating INSAT-3D data has been initiated. Fast Radiative Transfer coefficients for both CRTM & RTTOV are obtained. Radiances from the Model are computed Q.C being generated.

Observation



Simulation



ITSC-19 26 March -1 April 2014
Jeju Island, South Korea