Status of Asia-Pasific Regional ATOVS Retransmission Services

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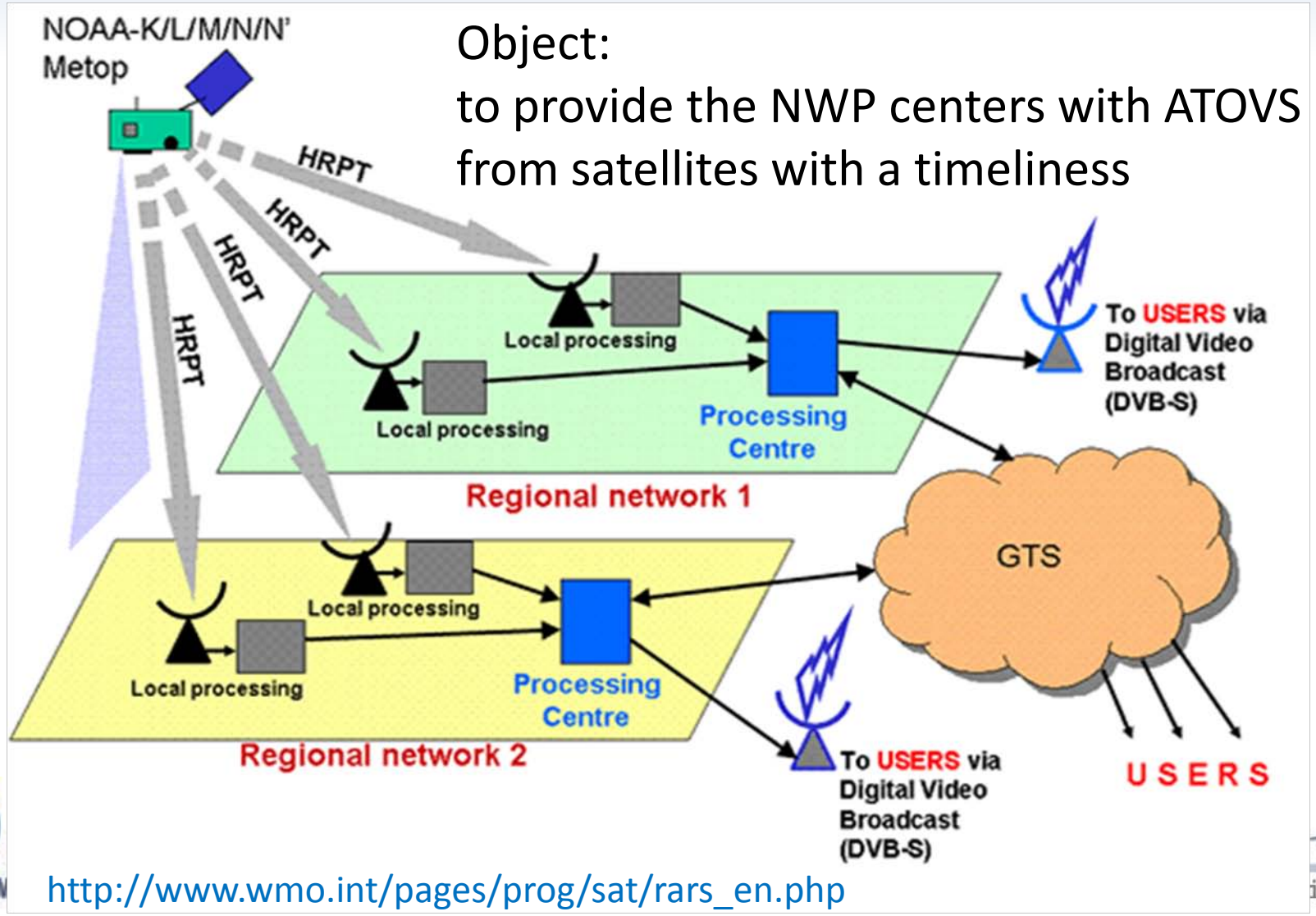
Contents

- What is RARS Concept ?
- JMA Activity for RARS
  -RARS Stations Received and Processed at JMA
  -Asia Pacific RARS Monitoring Web
- Future Plan

What is RARS Concept ?

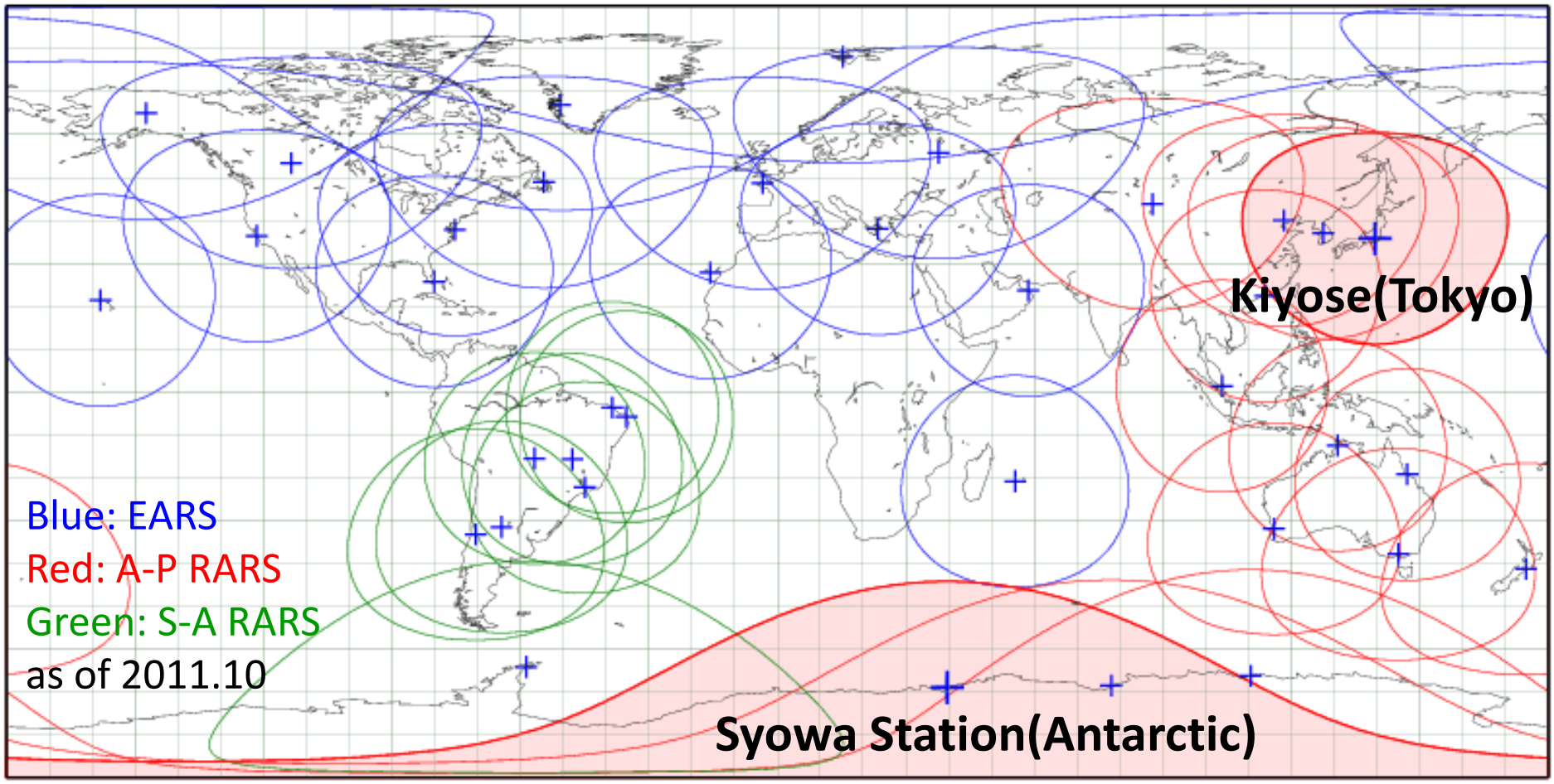
(Regional ATOVS Retransmission Service)



Object:
to provide the NWP centers with ATOVS data from satellites with a timeliness

http://www.wmo.int/pages/prog/sat/rars_en.php

RARS Stations



JMA Activity for RARS

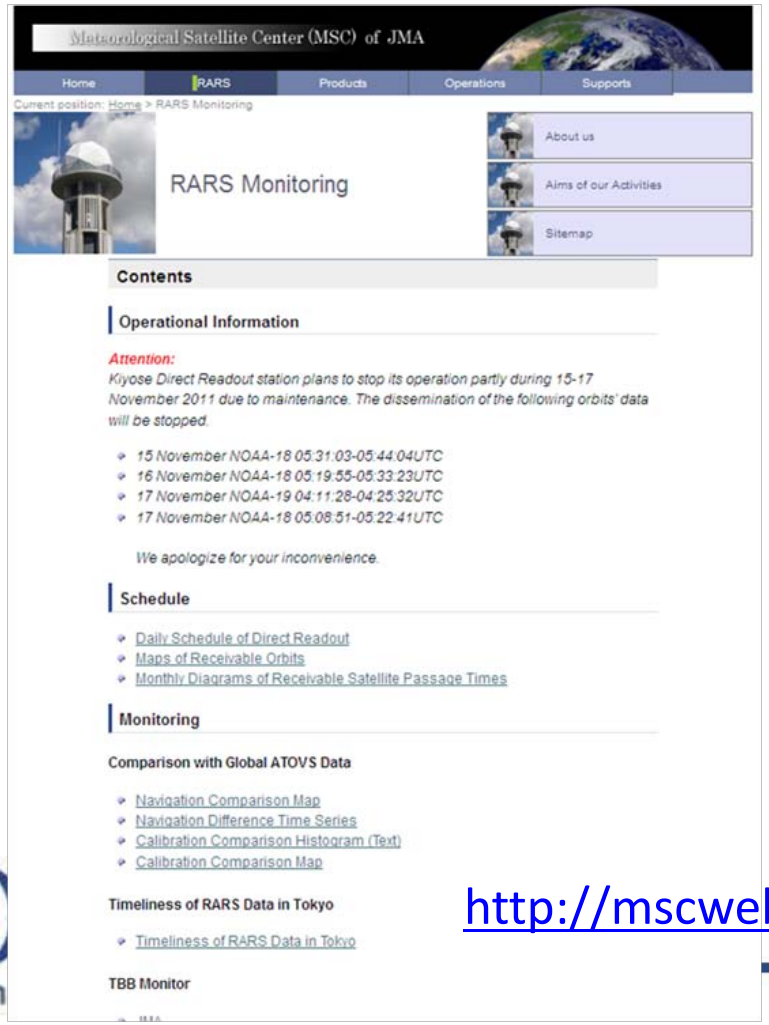
Station	Kiyose	Syowa Station
Owner	Japan Meteorological Agency (JMA)	National Institute of Polar Research (NIPR)
Location	Meteorological Satellite Center (MSC) Kiyose, Tokyo	Syowa Station, Antarctica
Latitude, Longitude	35.77N, 139.53E	69.00S, 39.58E
Satellites	NOAA-16, 18, 19 and Metop-A	NOAA-15, 16, 18 and 19
Software	AAPP version 6.15 provided by NWPSAF	
Data	ATOVS(AMSU-A,B,MHS,HIRS)	
BUFR edition	version 4	
BUFR provision start	7 Jun 2006	21 Aug 2006

transference on 27 July 2010

The new tower of Direct Readout Antenna at Kiyose, Tokyo

Asia Pacific RARS Monitoring Web site

- JMA opened an A-P RARS data monitoring web site on 7 Nov 2007.



- Monitoring Contents
  - Operational Information
  - Schedule
  - TBB Monitor
  - Comparison with Global ATOVS Data
    - Navigation Comparison Map
    - Calibration Comparison Map
  - Timeliness of RARS Data at Tokyo

http://mscweb.kishou.go.jp/rars/index.htm

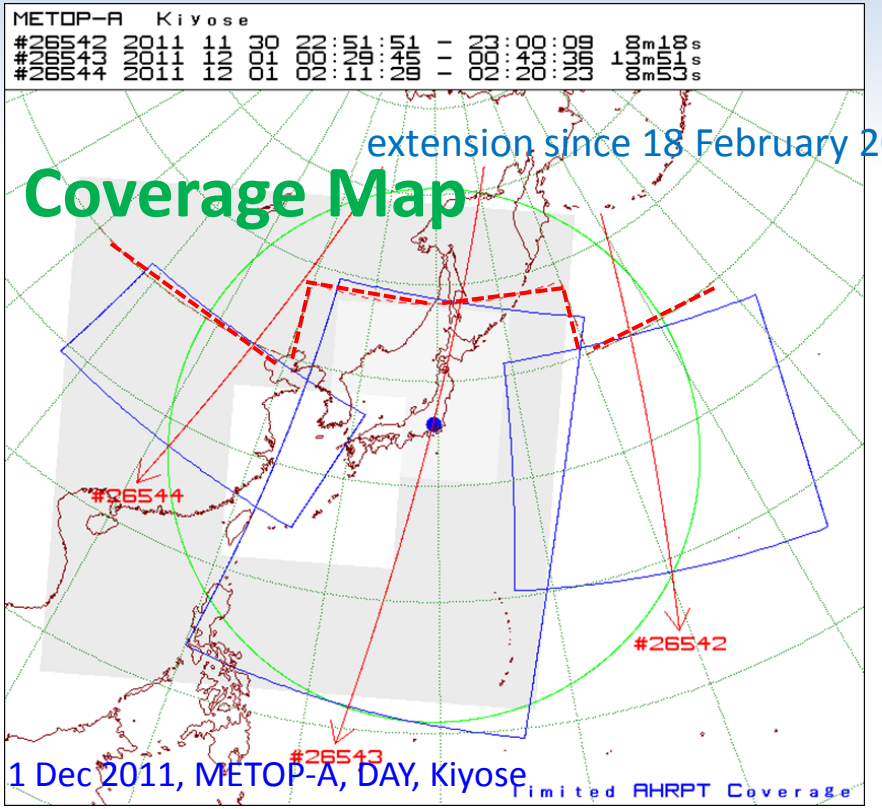
"Schedule"

Daily Schedule

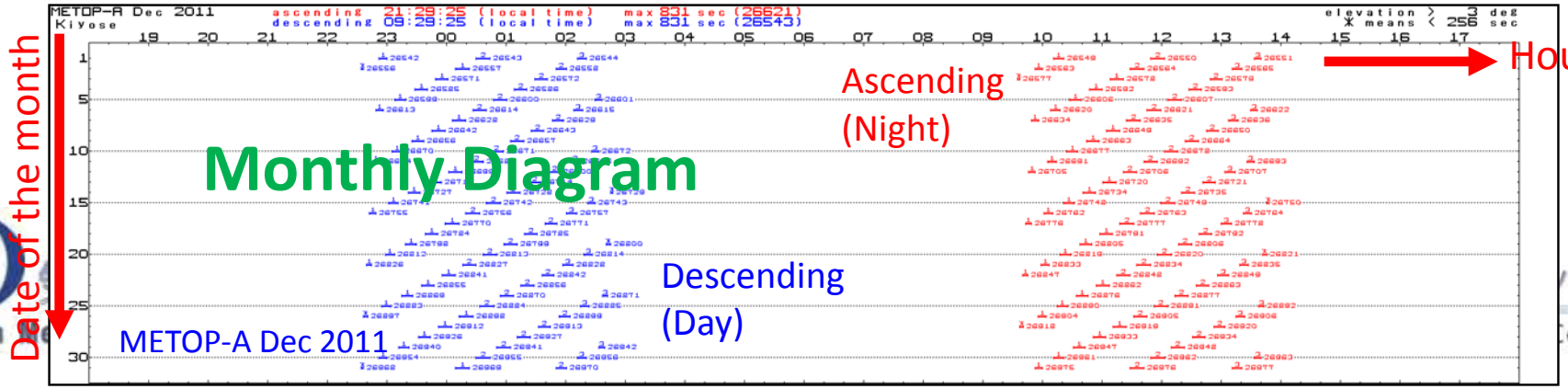
20111201

day	NOAA-16	21:39:30 - 21:50:44
	Metop-A	22:51:51 - 23:00:10
	NOAA-16	23:19:04 - 23:33:06
	Metop-A	00:29:45 - 00:43:36
	NOAA-16	01:02:20 - 01:08:49
	NOAA-19	01:48:17 - 01:55:33
	Metop-A	02:11:29 - 02:20:23
	NOAA-18	02:41:40 - 02:47:58
	NOAA-19	03:24:30 - 03:38:42
	NOAA-18	04:17:27 - 04:31:22
	NOAA-19	05:07:17 - 05:18:13
	NOAA-18	05:59:57 - 06:11:00
night	NOAA-16	09:02:53 - 09:15:17
	Metop-A	10:11:22 - 10:21:23
	NOAA-16	10:42:36 - 10:56:18
	Metop-A	11:48:53 - 12:02:43
	Metop-A	13:33:30 - 13:39:43
	NOAA-19	15:50:13 - 16:03:43
	NOAA-18	16:42:51 - 16:56:17
	NOAA-19	17:31:12 - 17:43:54
	NOAA-18	18:23:39 - 18:36:42

Coverage Map

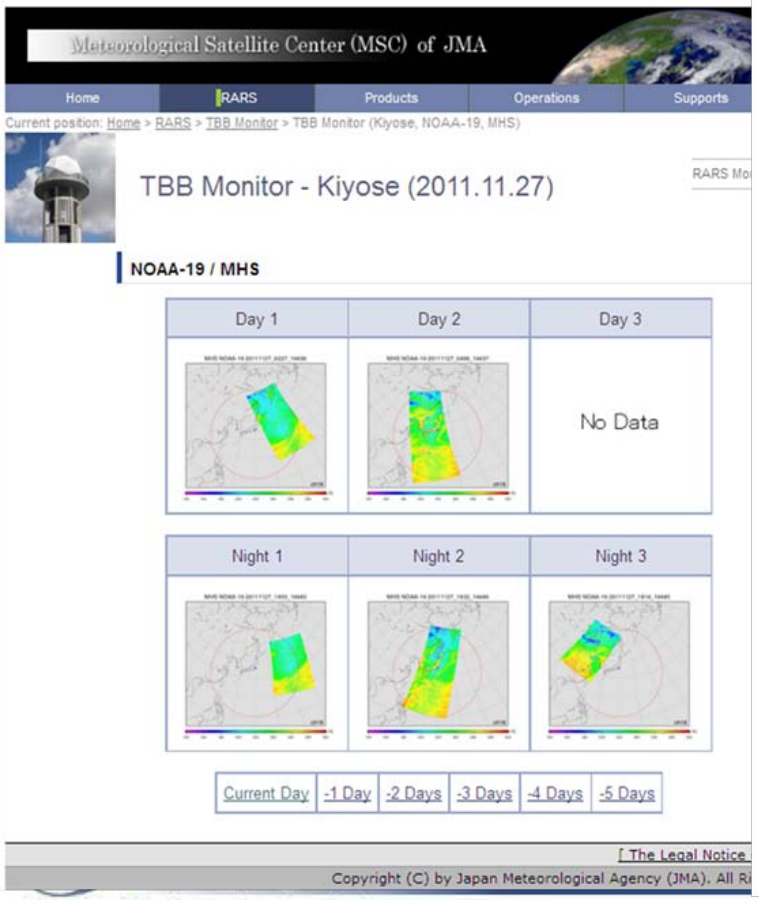


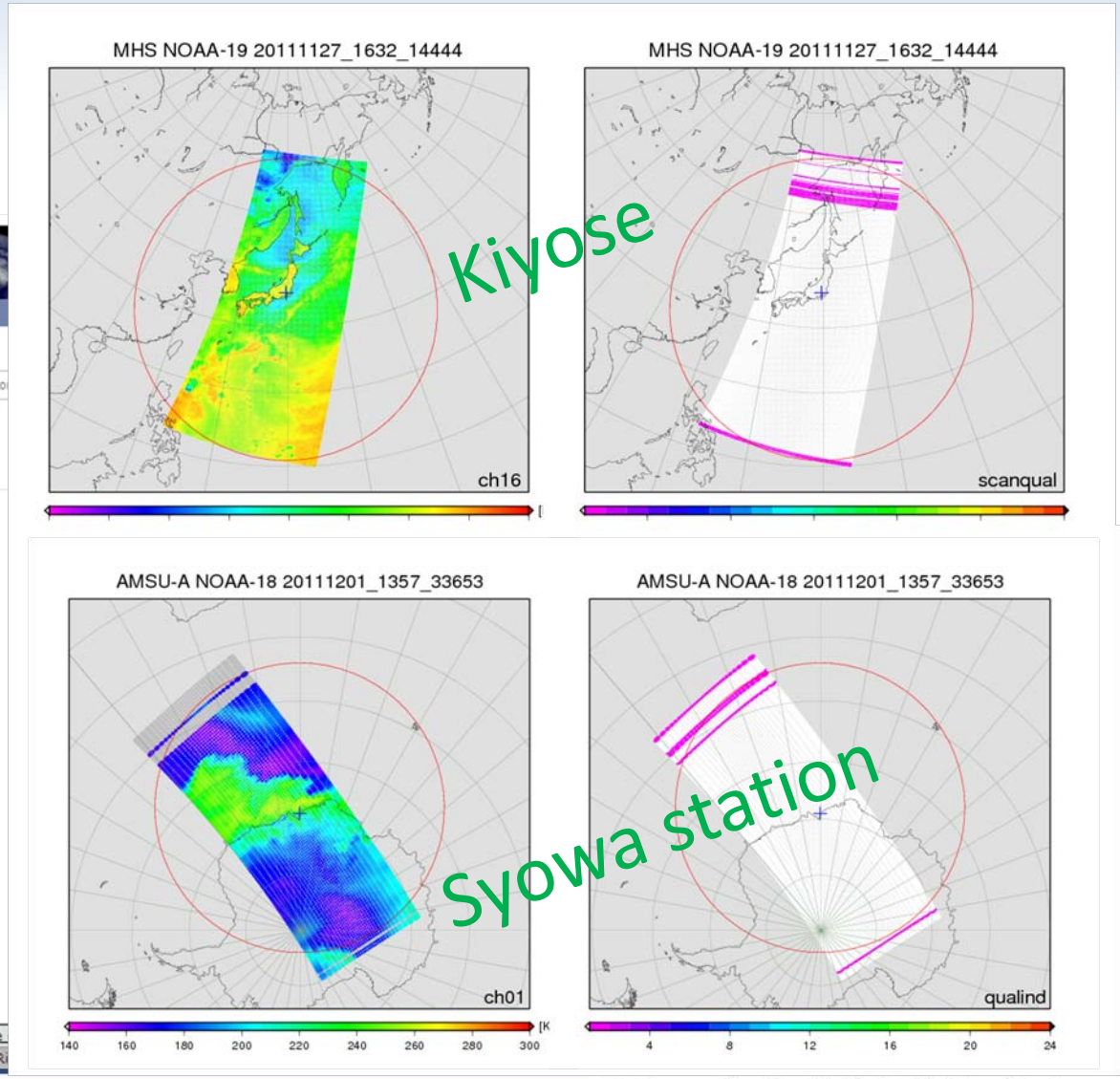
Monthly Diagram



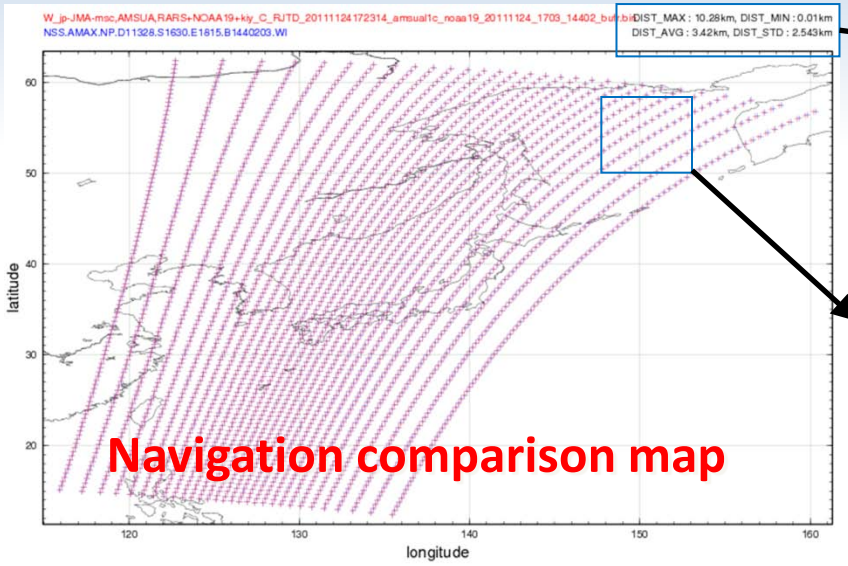
"TBB Monitor"

- Brightness temperature and data quality flags (number of bits on) are monitored
- AMSU-A,-B,MHS





"Comparison with Global ATOVS Data"

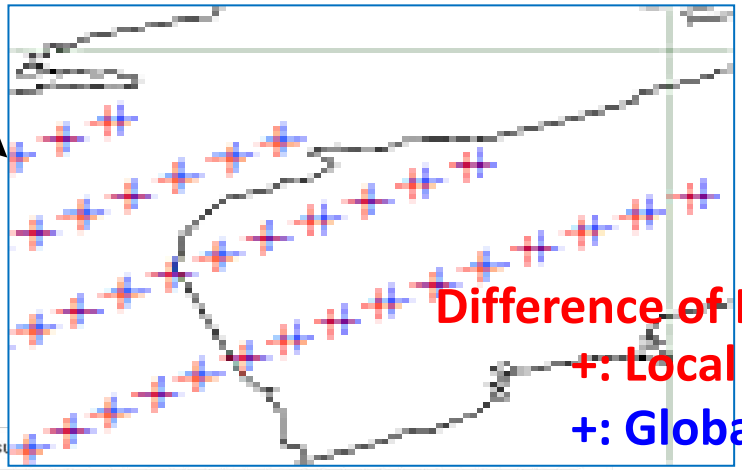


Navigation comparison map

Summary of the comparison

DIST_MAX : 10.28km, DIST_MIN : 0.01km

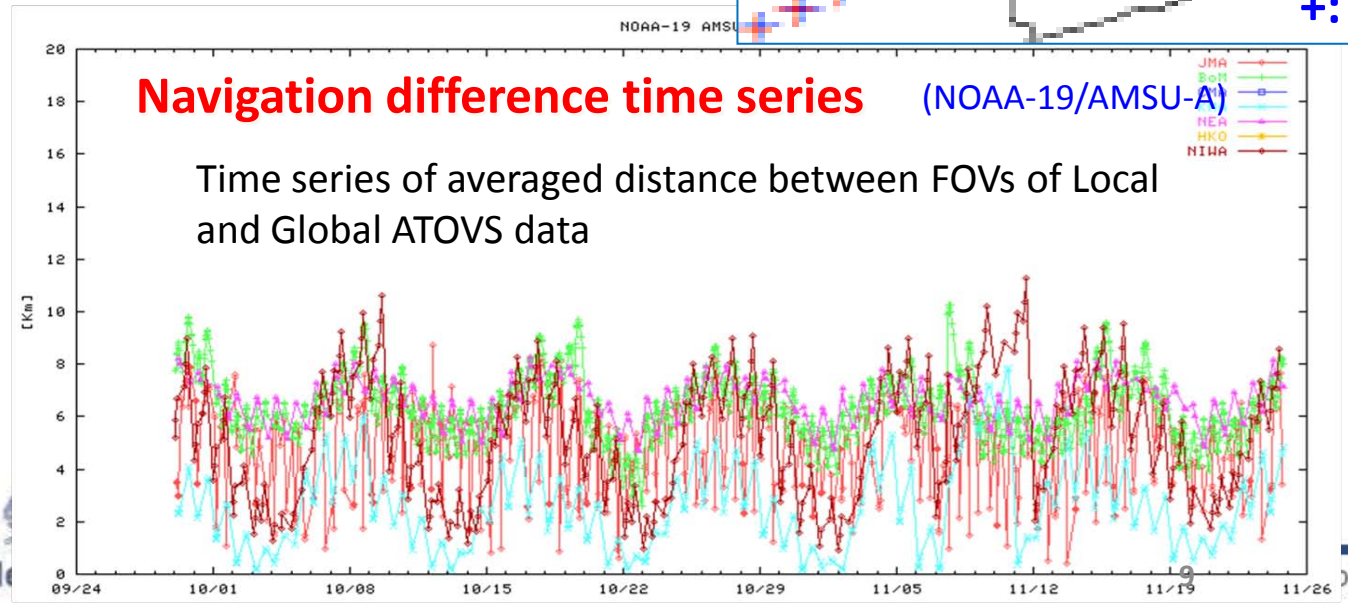
DIST_AVG : 3.42km, DIST_STD : 2.543km



Difference of FOV centers

+: Local

+: Global

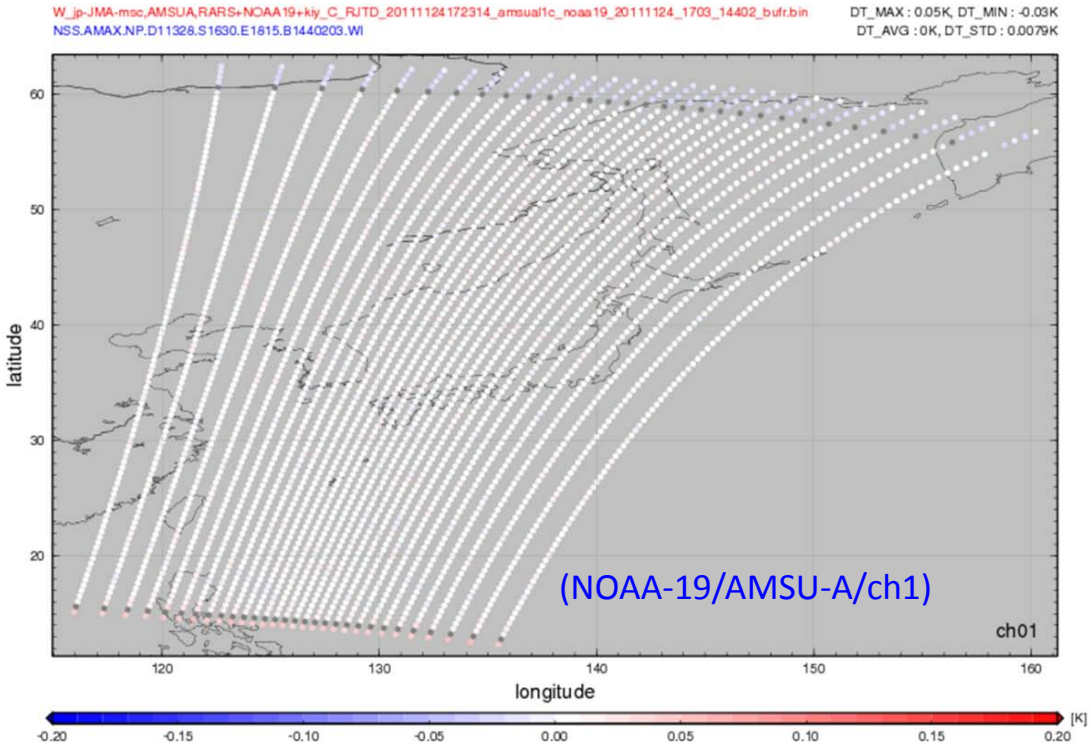


Navigation difference time series (NOAA-19/AMSU-A)

Time series of averaged distance between FOVs of Local and Global ATOVS data

"Comparison with Global ATOVS Data"

Calibration comparison Map

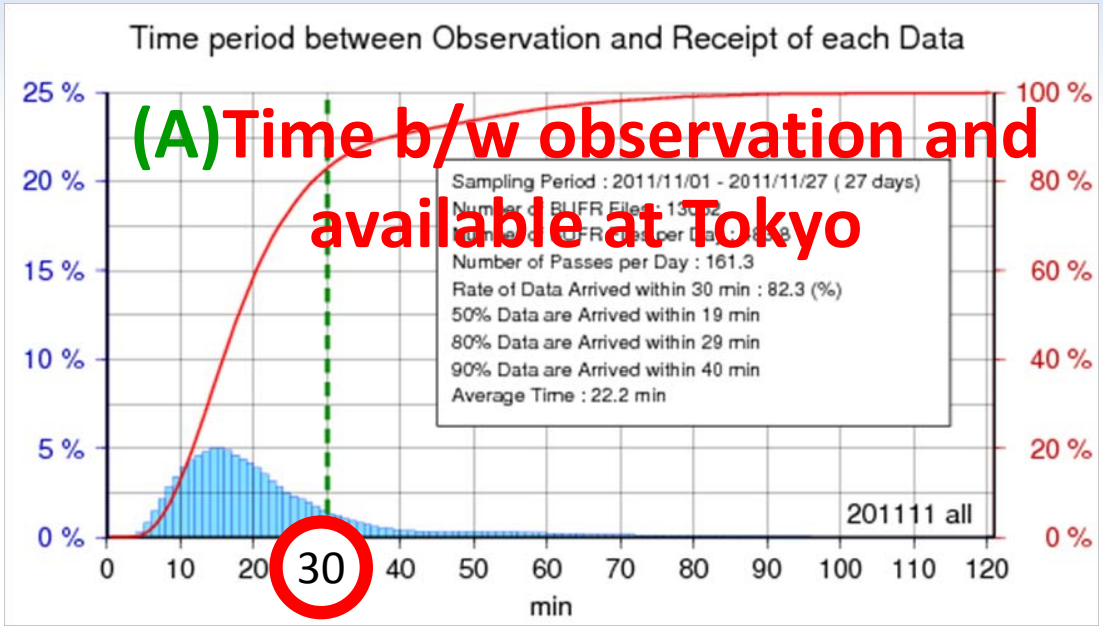


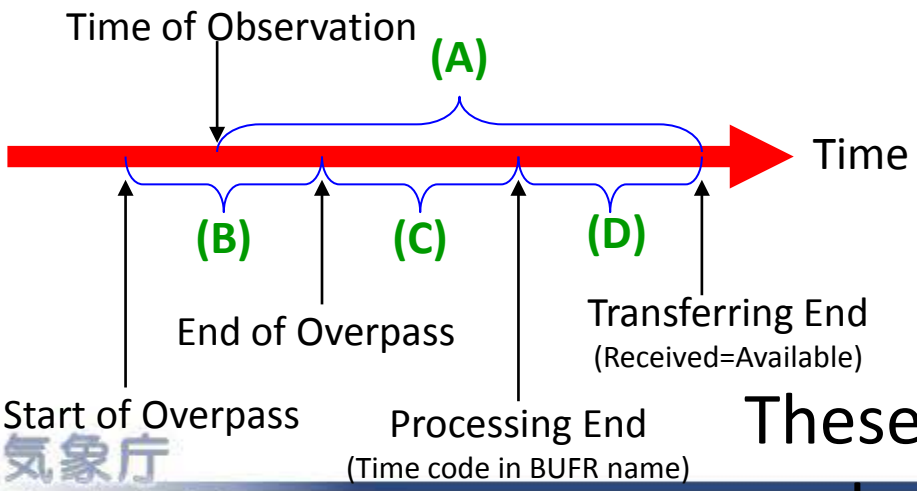
statistic

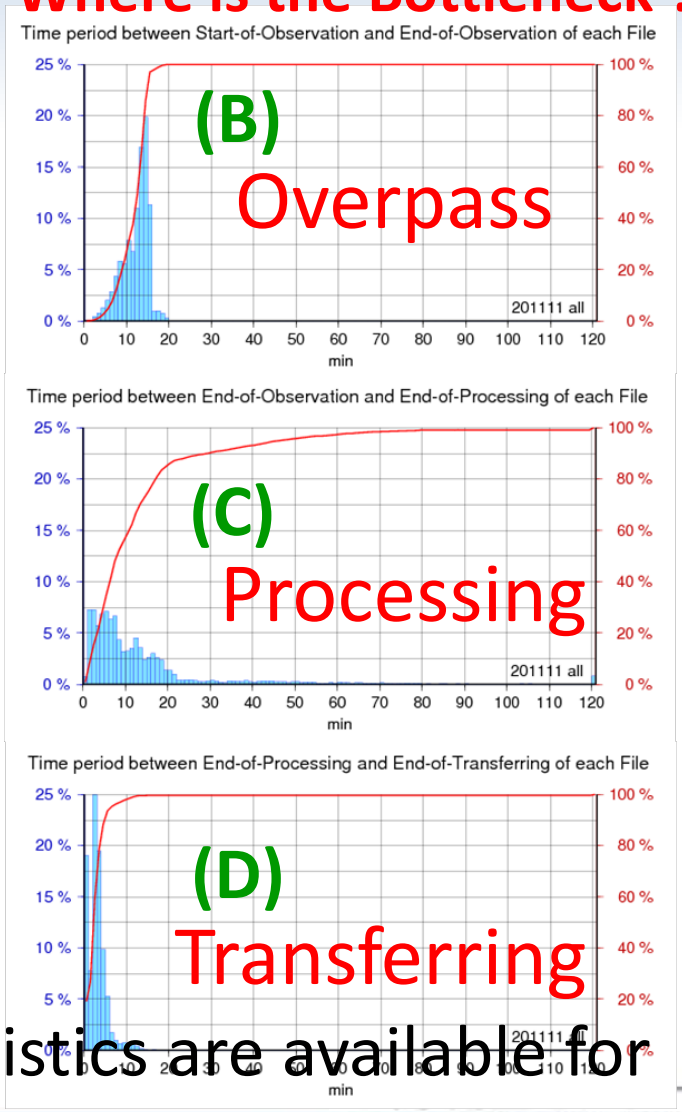
class	val	ge	lt	ch01	ch02	ch03	ch04	ch05
	-21	-999.999	-999.999	-0.205	0	0	0	0	0
	-20	-0.2	-0.205	-0.195	0	0	0	0	0
	-19	-0.19	-0.195	-0.185	0	0	0	0	0
	-18	-0.18	-0.185	-0.175	0	0	0	0	0
	-17	-0.17	-0.175	-0.165	0	0	0	0	0
	-16	-0.16	-0.165	-0.155	0	0	0	0	0
	-15	-0.15	-0.155	-0.145	0	0	0	0	0
	-14	-0.14	-0.145	-0.135	0	0	0	0	0
	-13	-0.13	-0.135	-0.125	0	0	0	0	0
	-12	-0.12	-0.125	-0.115	0	0	0	0	0
	-11	-0.11	-0.115	-0.105	0	0	0	0	0
	-10	-0.1	-0.105	-0.095	0	0	0	0	0
	-9	-0.09	-0.095	-0.085	0	0	0	0	0
	-8	-0.08	-0.085	-0.075	0	0	0	0	0
	-7	-0.07	-0.075	-0.065	0	0	0	0	0
	-6	-0.06	-0.065	-0.055	0	0	0	0	0
	-5	-0.05	-0.055	-0.045	0	0	0	0	0
	-4	-0.04	-0.045	-0.035	0	0	0	0	0
	-3	-0.03	-0.035	-0.025	45	4	0	0	0
	-2	-0.02	-0.025	-0.015	57	25	38	60	0
	-1	-0.01	-0.015	-0.005	204	133	159	205	33
	0	0	-0.005	0.005	2173	2295	2410	2316	2389
	1	0.01	0.005	0.015	514	391	453	441	511
	2	0.02	0.015	0.025	6	18	0	35	116
	3	0.03	0.025	0.035	3	44	0	3	11
	4	0.04	0.035	0.045	24	29	0	0	0
	5	0.05	0.045	0.055	4	59	0	0	0
	6	0.06	0.055	0.065	0	12	0	0	0
	7	0.07	0.065	0.075	0	18	0	0	0
	8	0.08	0.075	0.085	0	2	0	0	0
	9	0.09	0.085	0.095	0	0	0	0	0
	10	0.1	0.095	0.105	0	0	0	0	0
	11	0.11	0.105	0.115	0	0	0	0	0
	12	0.12	0.115	0.125	0	0	0	0	0
	13	0.13	0.125	0.135	0	0	0	0	0
	14	0.14	0.135	0.145	0	0	0	0	0
	15	0.15	0.145	0.155	0	0	0	0	0
	16	0.16	0.155	0.165	0	0	0	0	0
	17	0.17	0.165	0.175	0	0	0	0	0
	18	0.18	0.175	0.185	0	0	0	0	0
	19	0.19	0.185	0.195	0	0	0	0	0
	20	0.2	0.195	0.205	0	0	0	0	0
	21	999.999	0.205	999.999	0	0	0	0	0
NUM	available	-	-		3030	3030	3060	3060	3060
NUM	missing	-	-		60	60	30	30	30
NUM	all	-	-		3090	3090	3090	3090	3090
STAT	max	-	-		0.05	0.08	0.01	0.03	0.03
STAT	min	-	-		-0.03	-0.03	-0.02	-0.02	-0.01
STAT	avg	-	-		0.0007	0.0033	0.0007	0.0006	0.0024
STAT	std	-	-		0.0079	0.0118	0.0049	0.0058	0.0055
STAT	mode	-	-		0	0	0	0	0

"Timeliness of RARS Data at Tokyo"

Where is the Bottleneck ?



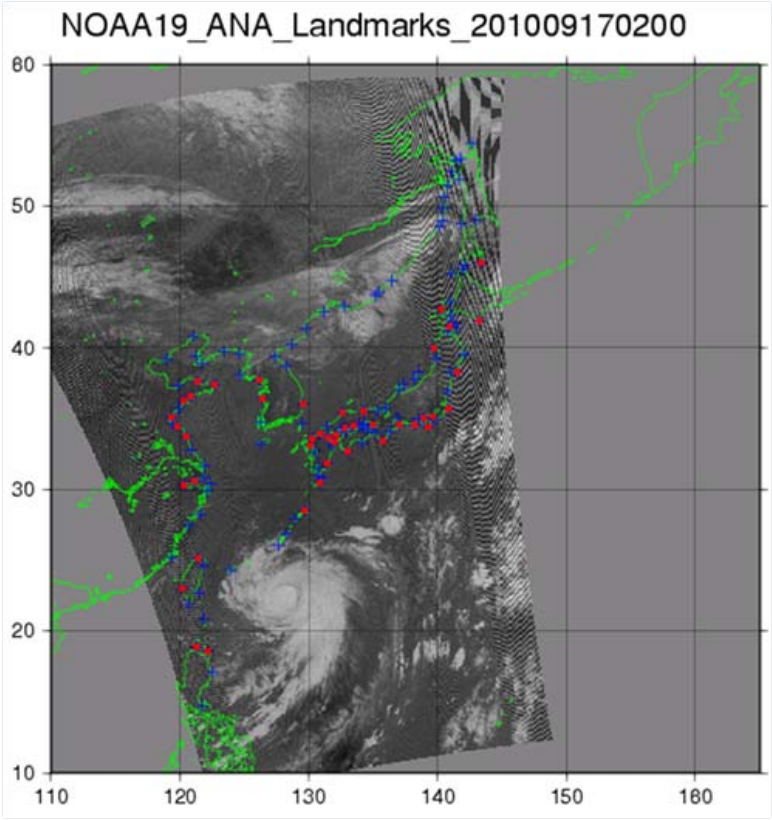




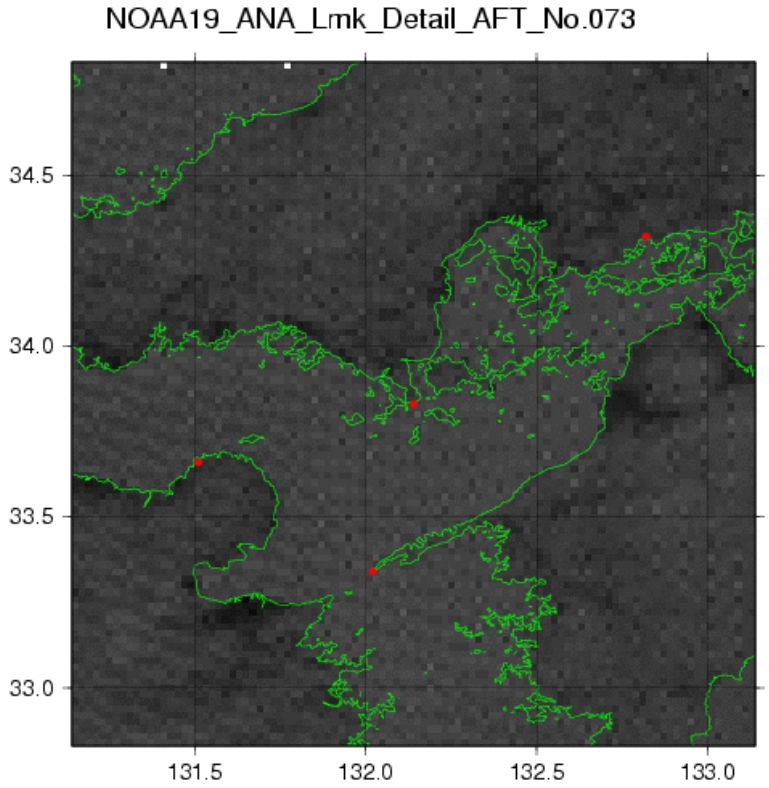
These statistics are available for each A-P RARS station data.

Landmark Navigation Correction with ANA-3

ANA (Automatic Navigation Adjustment)
by the Centre de Météorologie Spatiale (Météo-France)



Landmarks picked up by JMA

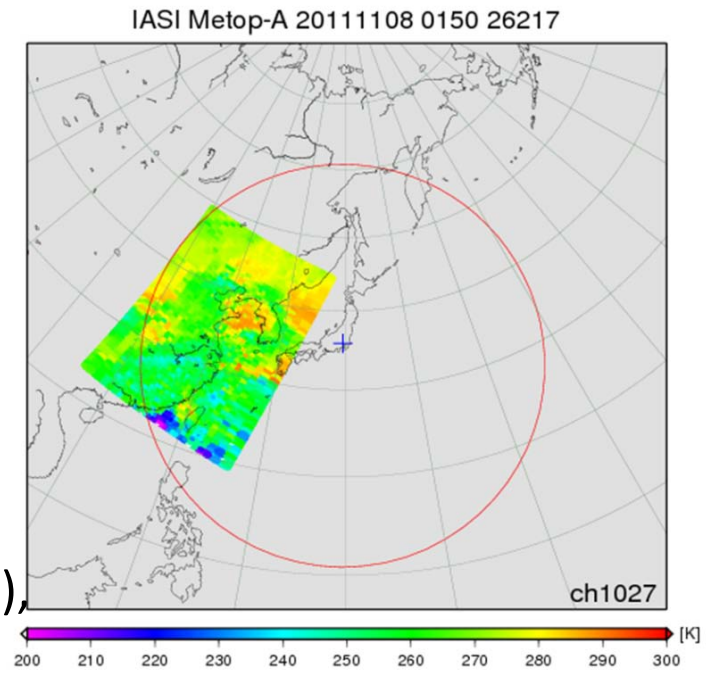


Satellite attitude correction parameters (yaw, roll, pitch) derived from AVHRR landmark matching with ANA-3 can be used in AAPP processing, resulting better navigation.

Future Plan
New Satellites/Sensors to be processed

- Metop-A(B)/IASI

Data processing software were obtained from NWP SAF and planed to be implemented in new system next year.



- NPP

ATMS(Advanced Technology Microwave Sounder),
CrIS (Crosstrack Infrared Sounder) ,
VIIRS (Visible Infrared Imaging Radiometer Suite)
Data is planned to be processed by necessary software AAPP, IPOPP and CSPP released.


Thank you for your attention.
ありがとうございました。