

## ABSTRACT

Nowadays LEO (Low Earth Orbit) weather satellite data is used as a key product in various fields. National Meteorological Satellite Center (NMSC)/Korea Meteorological Administration (KMA) is also utilizing these data for supporting weather forecast analysis and NWP model input. NMSC is receiving LEO weather satellite data directly such as MetOp-A/B, NOAA-15/18/19, Suomi-NPP, Terra/Aqua etc. ATOVS and IASI data is utilized for NWP data assimilation and we are preparing to use ATMS and CrIS for the local NWP model in KMA NWP team. NMSC is processing these data in real time by using AAPP(ATOVS and AVHRR Pre-processing Package), CSPP(Community Satellite Processing Package) and IAPP(International ATOVS Processing Package) and providing for users. NMSC is started DB-Net service for direct-readout IASI data since March 2017 for the first time Asia-Pacific region and preparing CrIS and ATMS data. In this paper, we will present KMA's LEO weather satellite operation status and future plan.

## 1. Introduction

KMA is not only operating the first Korean geostationary weather satellite, COMS, but also utilizing 19 weather satellites data received satellite direct broadcast, GTS, EUMETCast, NESDIS link and the other landline services. NMSC process sounder data by using package software for domestic and foreign NWP users.

Table 1. Information of NMSC's LEO Satellite Data Processing S/W

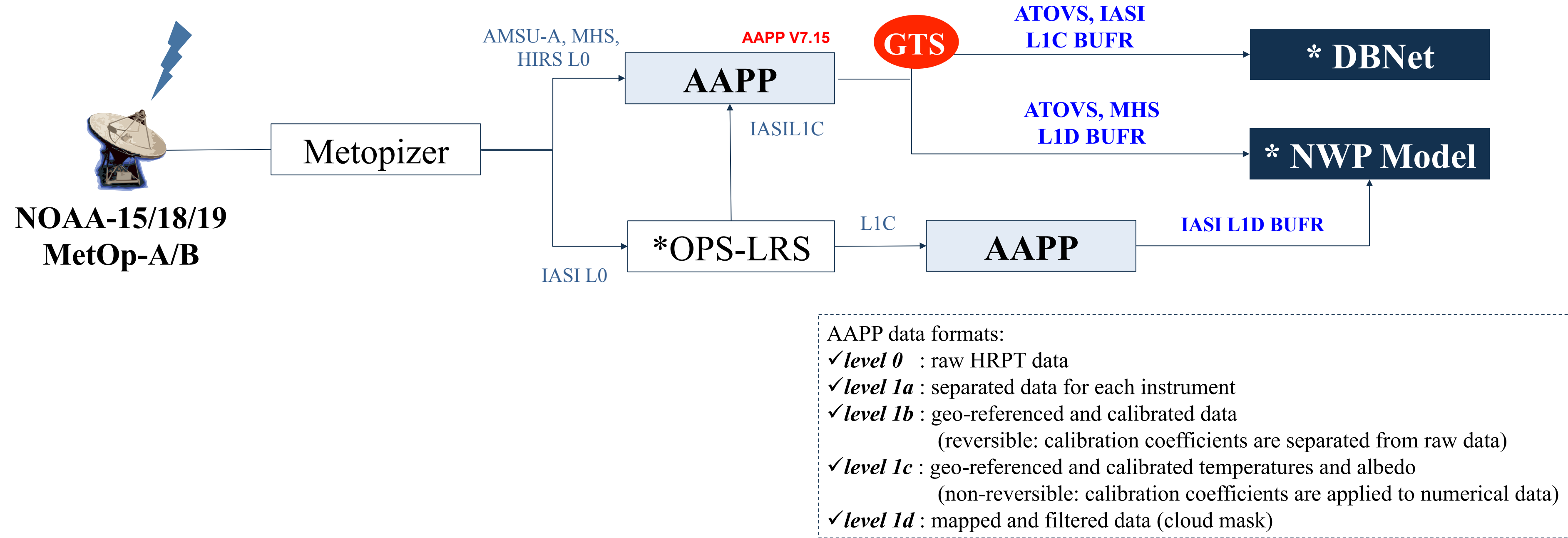
Satellite	Sensor	Data Processing Package / Version / Update Time
NOAA-15/18/19	*ATOVS	LV1) *AAPP / V7.15 / 2017.3.8.
	*AVHRR	LV2) *IAPP / V1.1 / 2017.5.11.
MetOp-A/B	ATOVS	NMSC's S/W
	AVHRR	
	*IASI	
S-NPP	ASCAT	LV1) AAPP / V7.15 / 2017.3.8.
	*VIIRS	NMSC's S/W
	*ATMS	LV1/2) *CSPP / SDR V2.2, EDR V2.0 / 2016.7.5.
Terra/Aqua	*CrIS	*IMAPP / V2.1 / 2017.5.11.
	MODIS	
	AMSR-E	
	AIRS	

## 2. Operational Scheme of NMSC

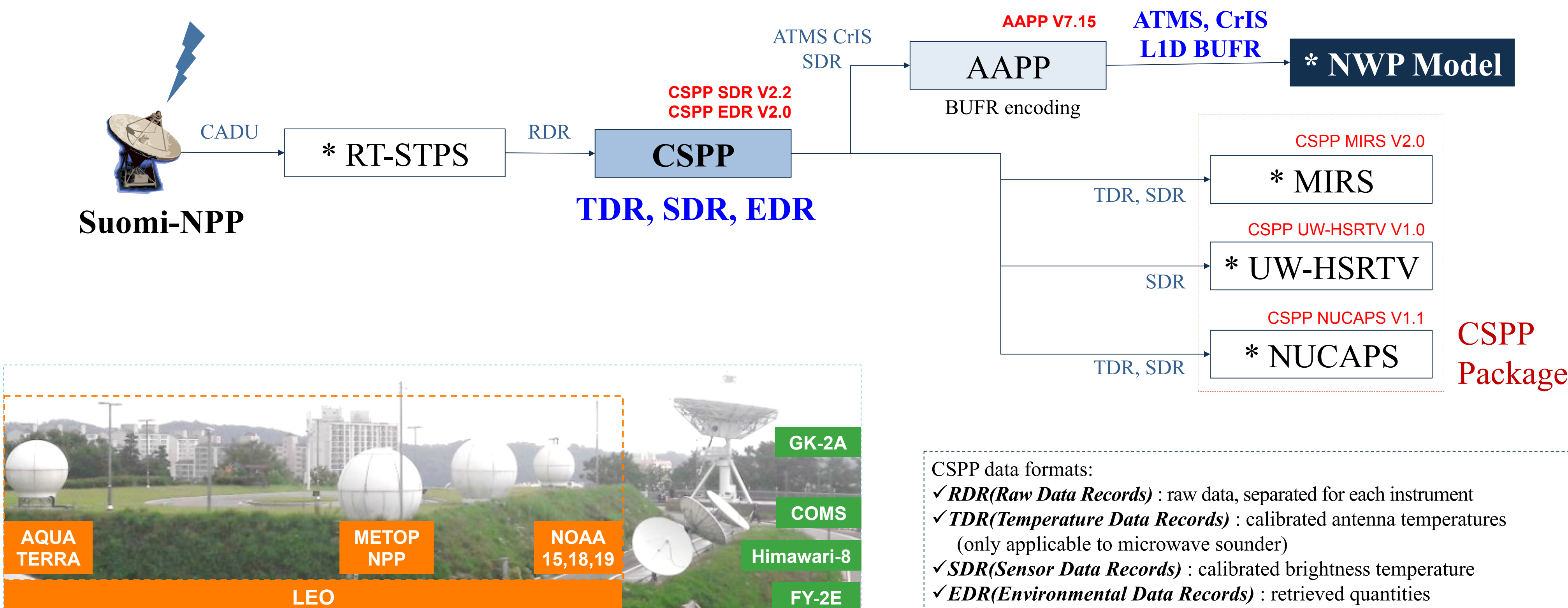
NMSC operates three antenna systems with priority for each LEO satellite reception. After receiving the raw data, data processing is performed using the respective package software such as AAPP and CSPP. The processed data is provided to KMA NWP Center and DBNet users as well as NMSC internal application systems.

### ► S/W Packages for Direct-readout LEO Satellite Data Processing in NMSC

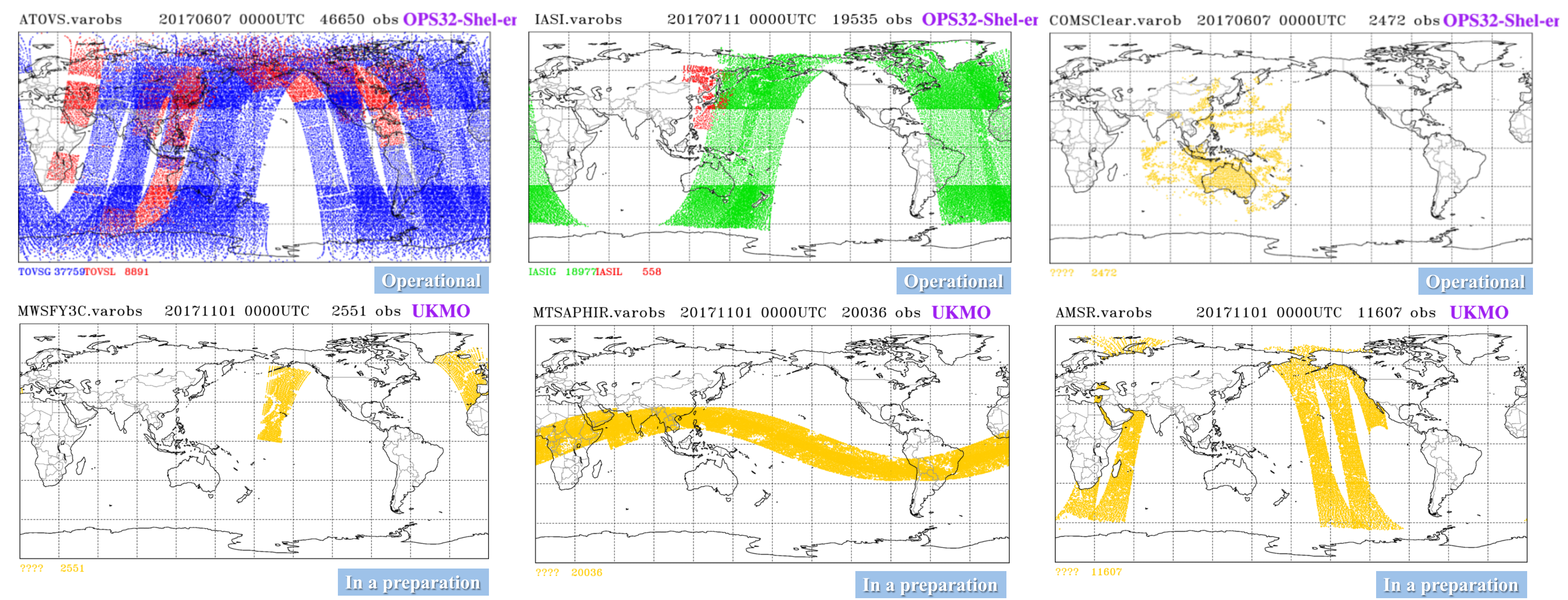
#### AAPP ATOVS and AVHRR Pre-processing Package



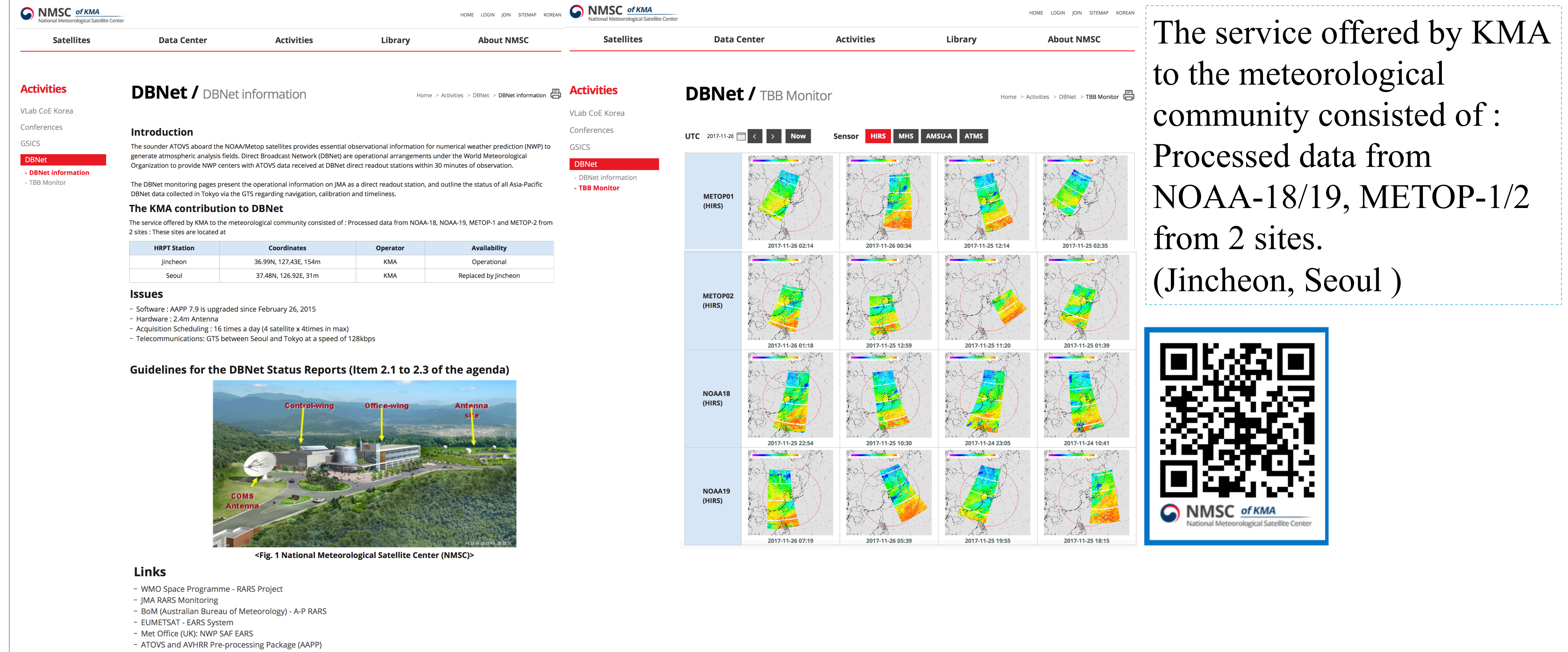
#### CSPP Community Satellite Processing Package




### ► Satellite Data in use on the UM Model in KMA



### ► NMSC's DBNet Monitoring Page



The service offered by KMA to the meteorological community consisted of :  
 Processed data from NOAA-18/19, METOP-1/2 from 2 sites.  
 (Jincheon, Seoul )



## 3. Summary and Future Plan

- NMSC process direct-readout LEO satellite data for internal and external NWP users.
  - MetOp-A/B, NOAA-15/18/19, Suomi-NPP, Terra/Aqua
  - Plan to JPSS receiving and processing system
- DBNet products(ATOVS, IASI) of KMA have been showing good performance in terms of quality and timeliness.
- Plan to produce ATMS and CrIS data in accordance with DBNet data conditions.
- For CSPP processing time improvement, hardware was upgraded and processing step was also optimized.

## 4. References

- Hyunjong Oh, 2016, KMA Report on DBNet Operation
- Bae et al., 2017, NMSC activities of LEO satellite data processing for KMA data assimilation
- Gumley et al., 2015, CSPP Polar-Orbiting Satellite Software and Products, CSPP/IMAPP Users' Group Meeting
- Nigel Atkinson, 2016, DBNet monitoring by NWP SAF.
- Nigel Atkinson, 2011: AAPP Overview Document

- \* AAPP: ATOVS and AVHRR Pre-processing Package
- \* AHRPT: Advanced High Resolution Picture Transmission
- \* ATMS: Advanced Technology Microwave Sounder
- \* ATOVS: Advanced TIROS Operational Vertical Sounder
- \* AVHRR: Advanced Very High Resolution Radiometer
- \* CCSDS: Consultative Committee for Space Data Systems
- \* COMS: Communication, Ocean and Meteorological Satellite
- \* CrIS: Cross-Track Infrared Sounder
- \* CSPP: Community Satellite Processing Package
- \* DBNet: Direct-readout Broadcast Network
- \* IAPP: International ATOVS Processing Package

- \* IASI: Infrared Atmospheric Sounding Interferometer
- \* IMAPP: International MODIS/AIRS Processing Package
- \* MIRS: Microwave Integrated Retrieval System
- \* NUCAPS: NOAA Unique CrIS/ATMS Product System
- \* NWP: Numerical Weather Prediction
- \* OPS-LRS: Operation Software - Local Reception Station
- \* RT-STPS: Real-Time Software Telemetry Processing System
- \* Suomi-NPP: Suomi-NPOESS Preparatory Project
- \* UW-HSRTV: University of Wisconsin-madison Hyper Spectral Retrieval
- \* VIIRS: Visible/Infrared Imager Radiometer Suite