Preparing Users to FY-4

-- Next Generation of CMA Geostationary Meteorological Satellites

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CMA report on Side Event of WMO EC-65
WMO HQ Geneva， May 17,2013

NSMC

CMA satellite programs

Current Satellite Programs

- FY-2D/E/F(operational, geo.)
- FY-3A/B(R&D, polar)

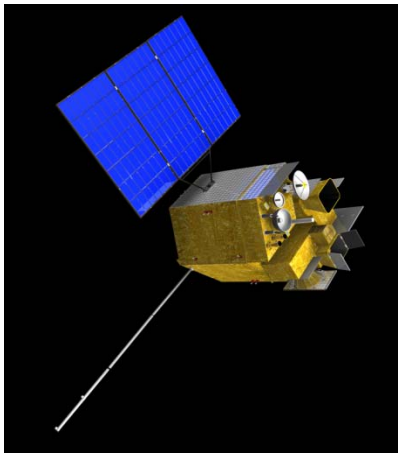
Future Satellite Programs

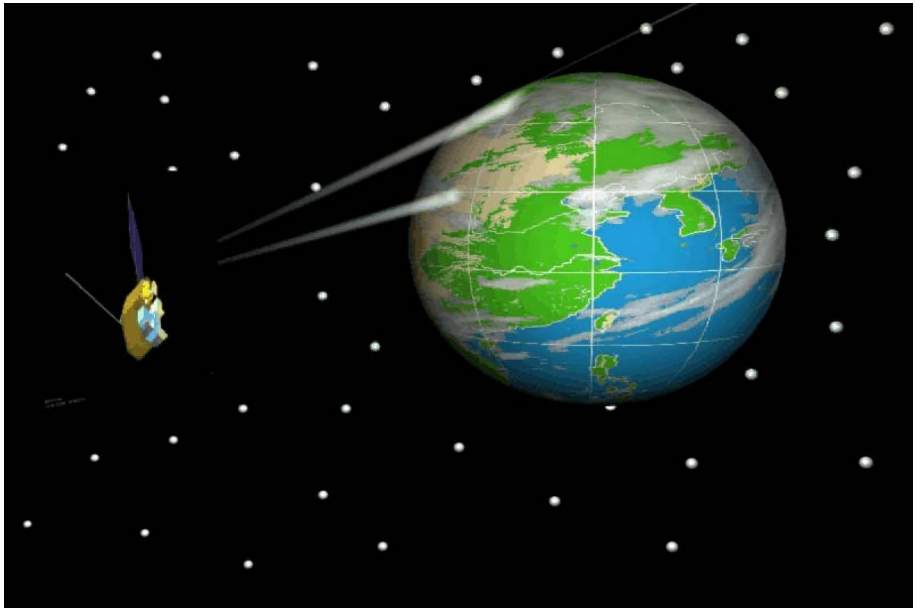
- FY-2G/H(operational, geo.)
- FY-3C/D/E/F (operational, polar)
- FY-4A(R&D, geo)
- FY-4B/C (operational, geo.)

Others

- EO Satellites (NOAA, Meteosat, MTSAT,EOS etc.)
- Ground System with 24/7 Satellite operations and data processing

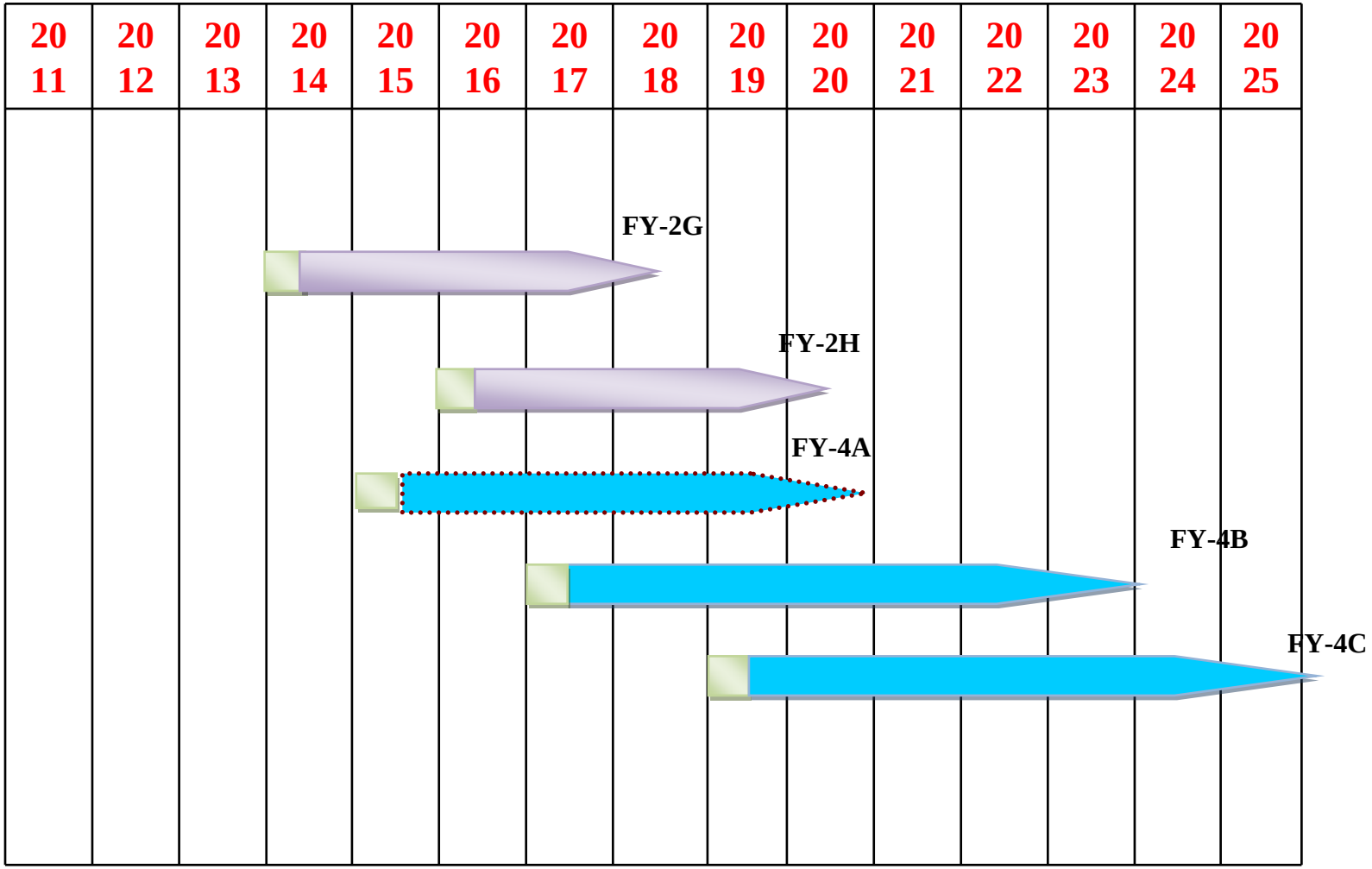
FY-4: New generation of FengYun GEO.



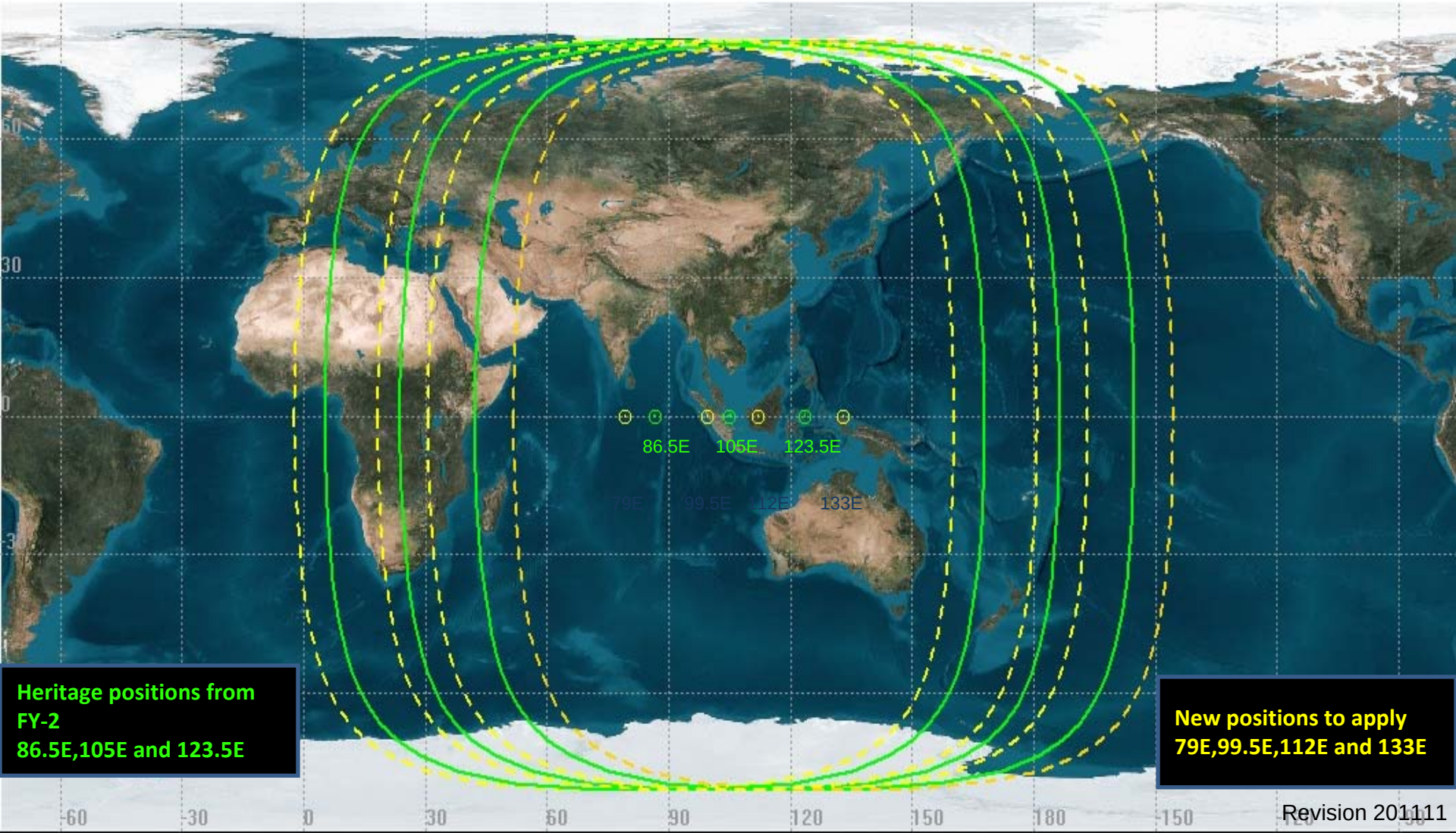


No.	Planed Launch	Designed Life	Status
FY-4A	2015	5 years	R&D
FY-4B	2017	7 years	Op.
FY-4C	2019	7 years	Op.

FengYun Geostationary Satellites Launch Plan



Orbital positions for FY-4



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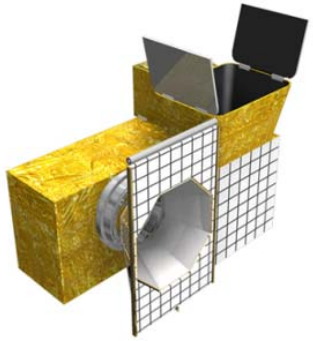
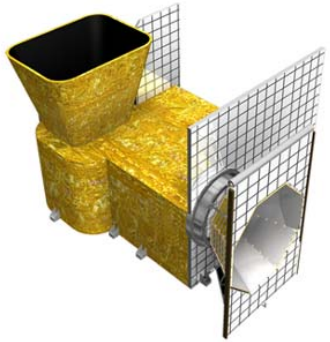
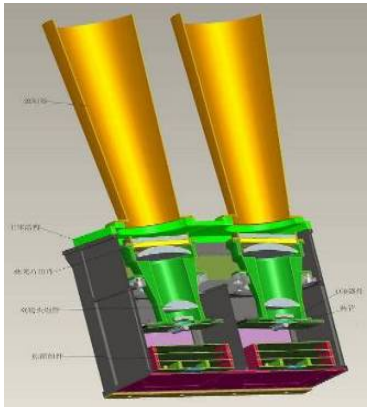
FY-4A Instruments







AGRI	GIIRS	LMI
Advanced **G**eo. **R**adiation **I**mager	**G**eo. **I**nterferometric **I**nfrared **S**ounder	**L**ighting **M**apping **I**mager
14 Channels within 0.55~13.8 μ m	538 LWIR Channels 375 S/MIR Channels	Central Frequency: 777.4nm
500mx1;1Kmx2 2Kmx4; 4Kmx7	16Km	7.8Km
S/N： 90 ~ 200 NE Δ T： 0.2 ~ 0.7K	Radiometric Calibration accuracy: 1K Spectral Calibration accuracy:10ppm	S/N ＞=6
Full Disk ＜=15min	Meso-scale： 35min(1000x1000km) China area： 67min(5000x5000km)	2ms

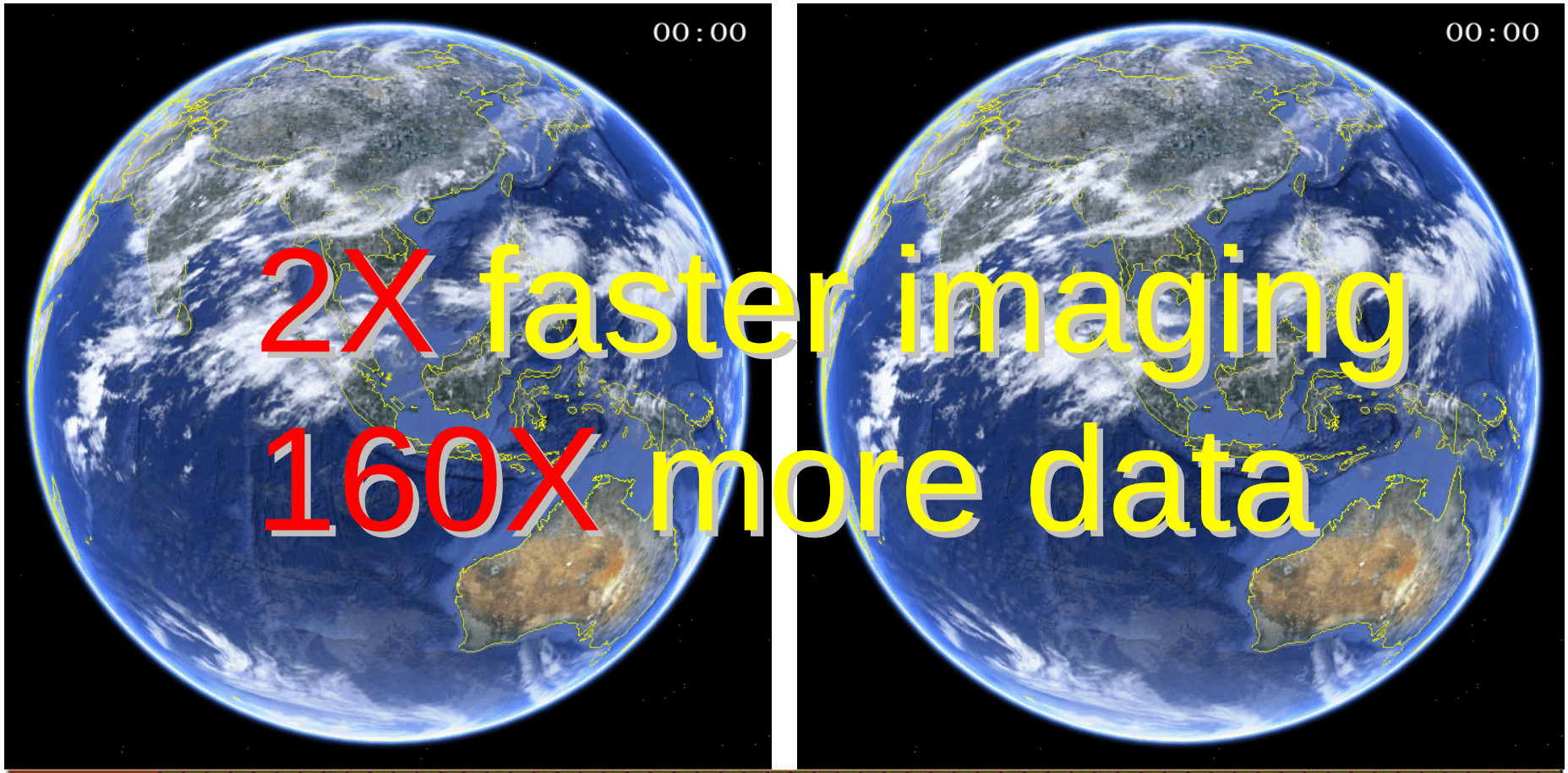
Advancement of FY-4A compared with FY-2

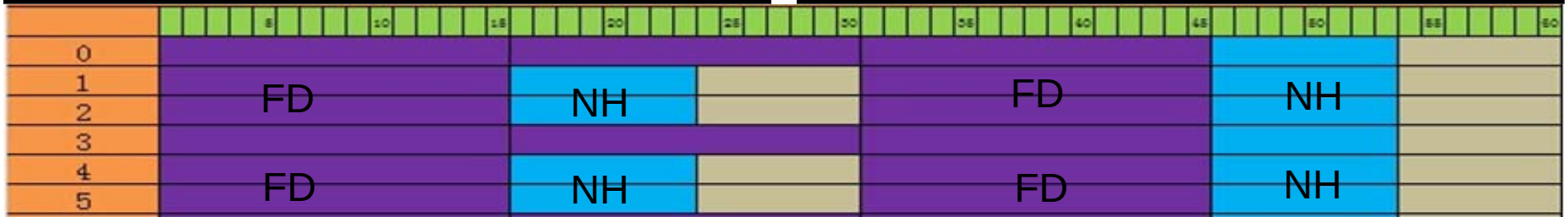
	FY-4A	FY-2
Stabilization	**Three-axis**	**Spin**
Designed Life	**5~7 Years**	**4 Years**
Observation Efficiency	**85%**	**5%**
Observation Mode	**Imaging +Sounding + Lightning Mapping**	**Imaging Only**
Main Instruments	**AGRI :14 channels** SSP Resolution：0.5~4Km Global imaging：15min Flexible imaging ： 2D	**VISSR: 5 channels** SSP Resolution：1.25~5Km Global imaging：30min Flexible imaging ： 1D
	GIIRS:913 channels Spectral Resolution: 0.8,1.6cm-1 SSP Resolution:16Km	**N/A**
	LMI SSP Resolution:7.8Km	**N/A**
	SEMS High energy particles Magnetic field	**SEM** High energy particles Solar X ray fluxes

AGRI Observation Modes

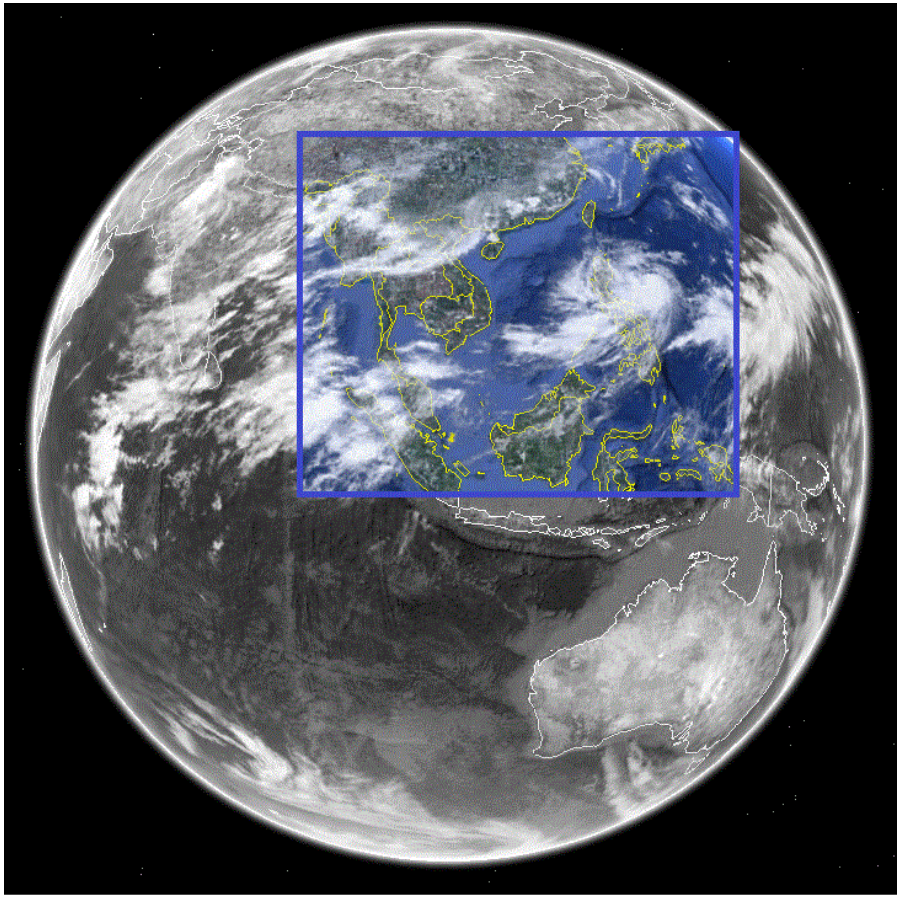
Normal Mode 56 FD

Flooding Season Mode 56 FD+40NH

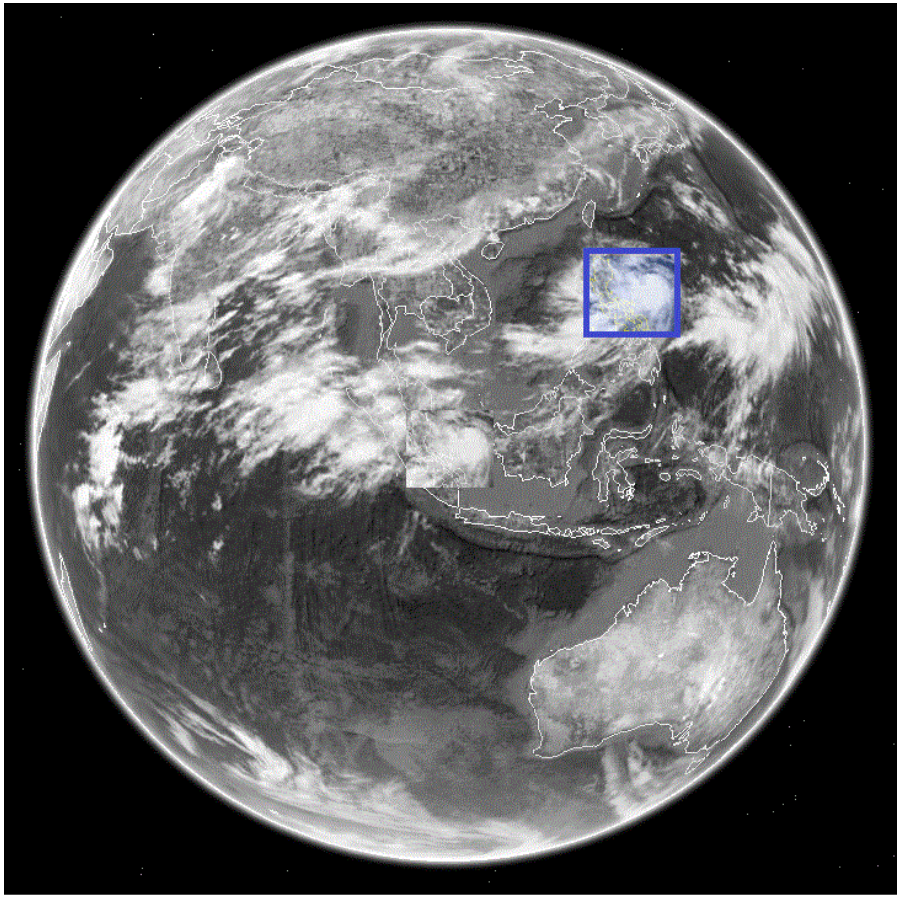




GIIRS Observation Modes:



Regional mode:
5000KMX5000KM, 60 min intervals



Meso-scale mode:
1000KmX1000Km, 30 min intervals

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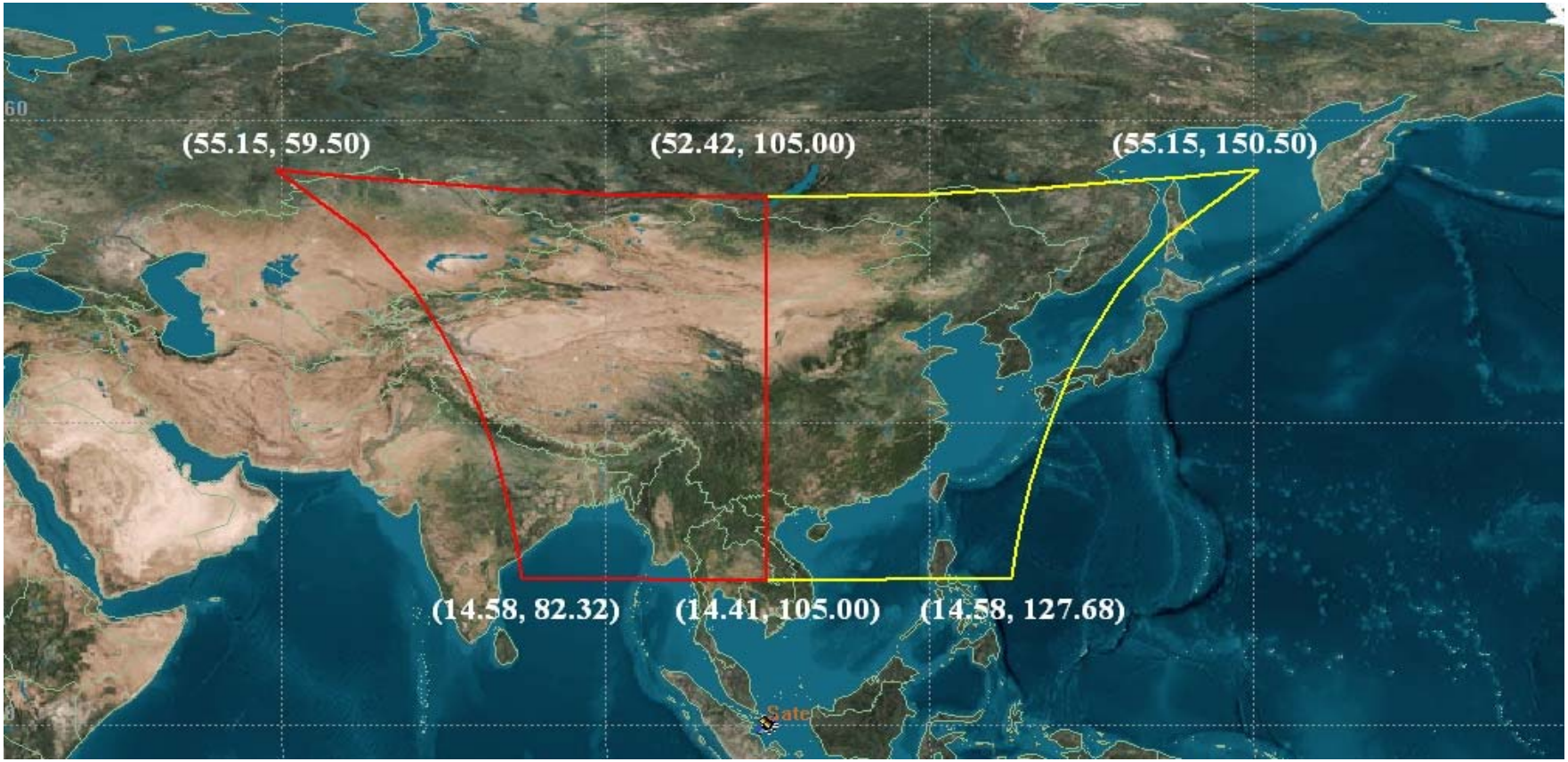
LMI Observation Mode



Spatial Coverage for LMI at 105°E
FPA Size: (400 × 300 × 2)

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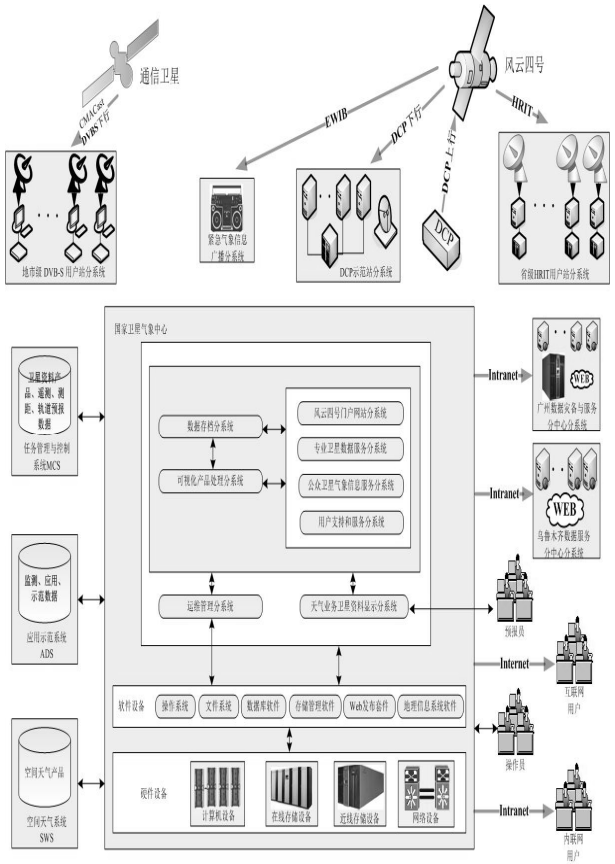
FY-4 Products

27 key operation products from AGRI, GIIRS & LMI defined and developed

No .	Products	No.	Products	No.	Products
1	Clear Sky Masks	10	Downward Longwave Radiation: Surface	19	Rainfall Rate/QPE
2	Cloud Top Height	11	Upward Longwave Radiation: TOA	20	Convective Initiation
3	Cloud Top Temperature	12	Upward Longwave Radiation: Surface	21	Tropopause Folding Turbulence Prediction
4	Cloud Top Pressure	13	Reflected Shortwave Radiation: TOA	22	Sea Surface Temperature (skin)
5	Cloud Optical Depth	14	Downward Shortwave Radiation: Surface	23	Fire/Hot Spot Characterization
6	Cloud Liquid Water	15	Legacy Vertical Moisture Profile	24	Land Surface (Skin) Temperature
7	Cloud Particle Size Distribution	16	Ozone Profile & Total	25	Land Surface Emissivity
8	Aerosol Detection	17	Derived Motion Winds	26	Snow Cover
9	Aerosol Optical Depth	18	Lightning Detection	27	Space weather products

FY-4 Data Distribution and Service System



Main functions：

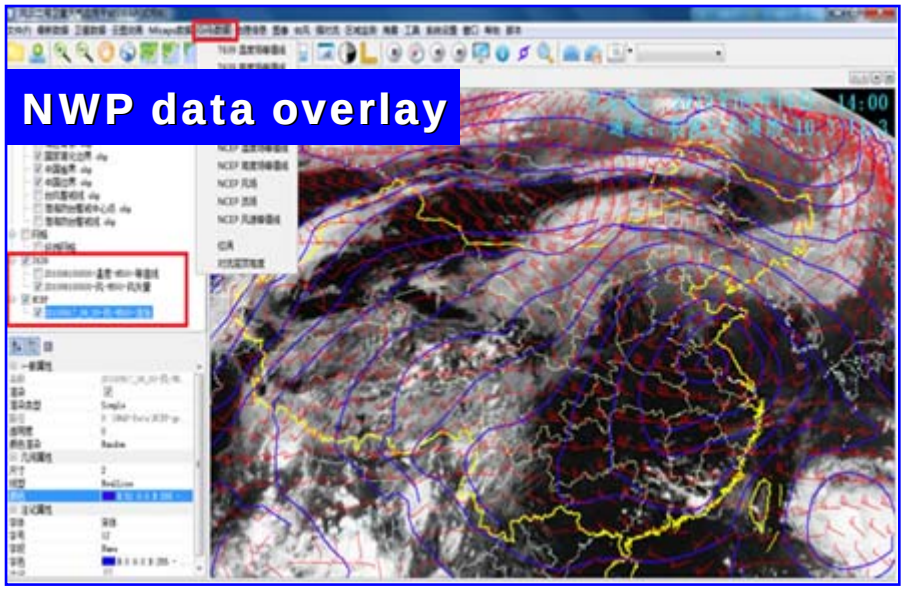
- To provide uplink data for DB users
- To make FY-4 data and products available via CMACast， Internet, and dedicated links
- To establish a stable and reliable data archiving and management system
- To build an EWIB system to response to significant weather events

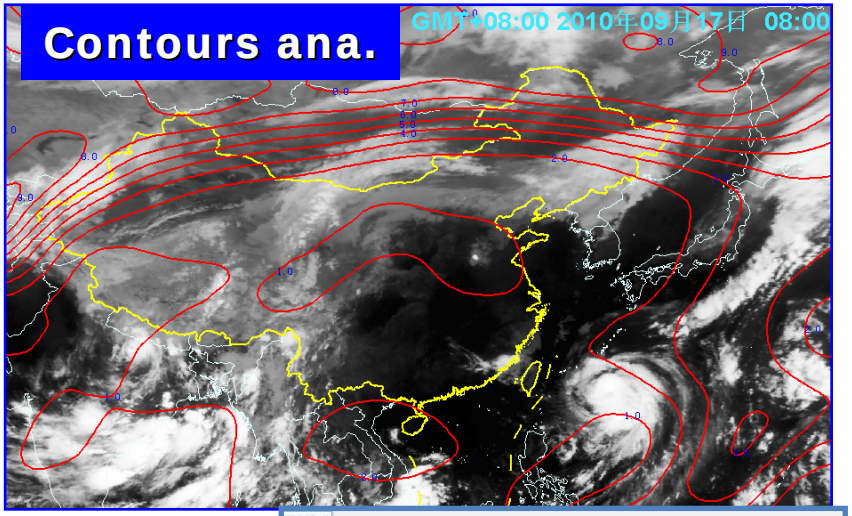
FY-4 Direct Broadcast Capabilities:

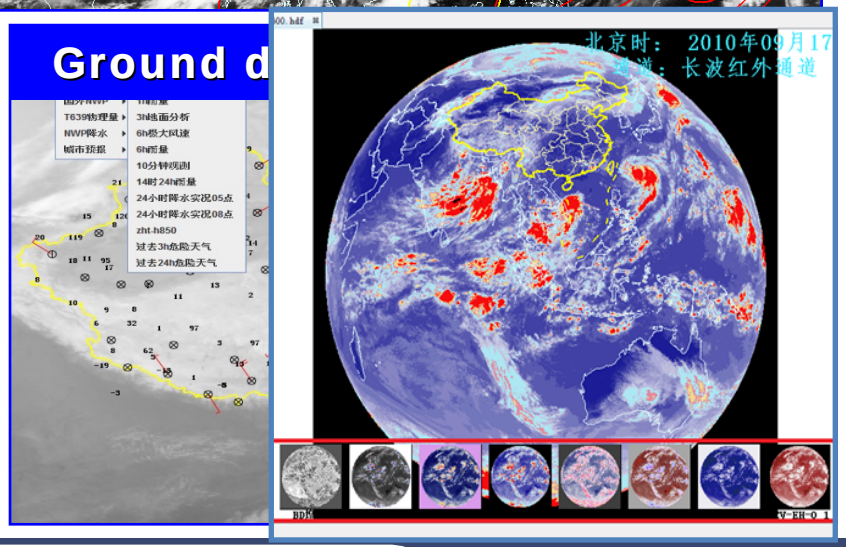
No	Channel	Band Width	Max. Data daily
1	HRIT 1	8Mbps	93.3GB
2	HRIT 2a/b	3Mbps/1Mbps	38.9GB/11.67GB
3	LRIT	150Kbps	1.67GB
4	DCP	600bps	6MB

HRIT1: all 14 channel data of AGRI, LMI data
HRIT2a/b: a)resampled data of AGRI, b) GIIRS data
LRIT: low resolution information transmission
DCP： data collection platform

Preparing Users to FY-4







- Efficient and professional analysis tools for forecasters
- supporting multiple data, including polar satellite data, conventional data and NWP products etc.

SWAP --
Development, Promotion and Training

- ✓ SWAP development and test was finished in March, 2013
- ✓ Current version(SWAP 1.0) works for FY-2, and will be upgraded for FY-4
- ✓ Promotion and training activities have been organized by CMA
- ✓ The system has been installed for trial application in more than 10 provincial weather services in China

Way Forward

1. High accuracy of data calibration and navigation of FY-4 are crucial to applications, consistent efforts are needed to meet the requirements for operational use before and after launch.
2. In-depth research and demonstration efforts are encouraged for the applications of new data in weather analysis, NWP, etc., including AGRI, GIIRS and LMI data.
3. In order to ensure the accessibility of FY-4 data , the CMACast will be upgraded to enable the near real-time data dissemination , and a Web-based product service system will be developed and make products available to users
4. DB data users need to replace their receiving stations for FY-4
5. A number of training activities are scheduled by CMA.
6. CMA will keep its commitment to open data policy for FY-4. Engagement of regional and global users in the application of FY-4 data are welcome.

Thank you