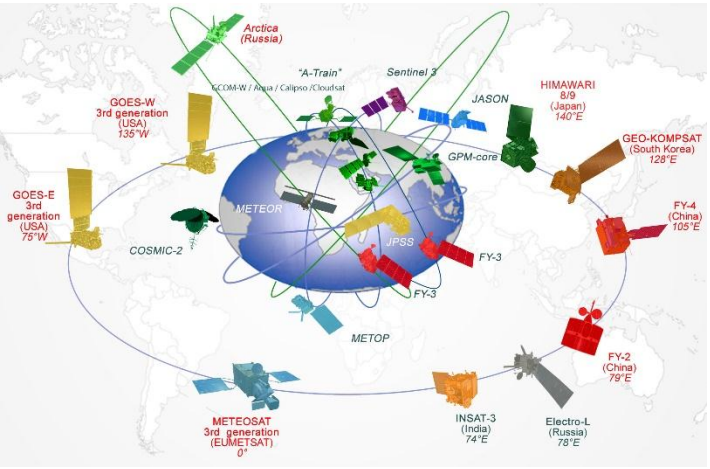


Status report on the current and future satellite systems by CMA

Presented to CGMS-49 plenary session, agenda item [02]

Status of Current Fengyun Satellite Systems

7 Fengyung satellites operating in orbit

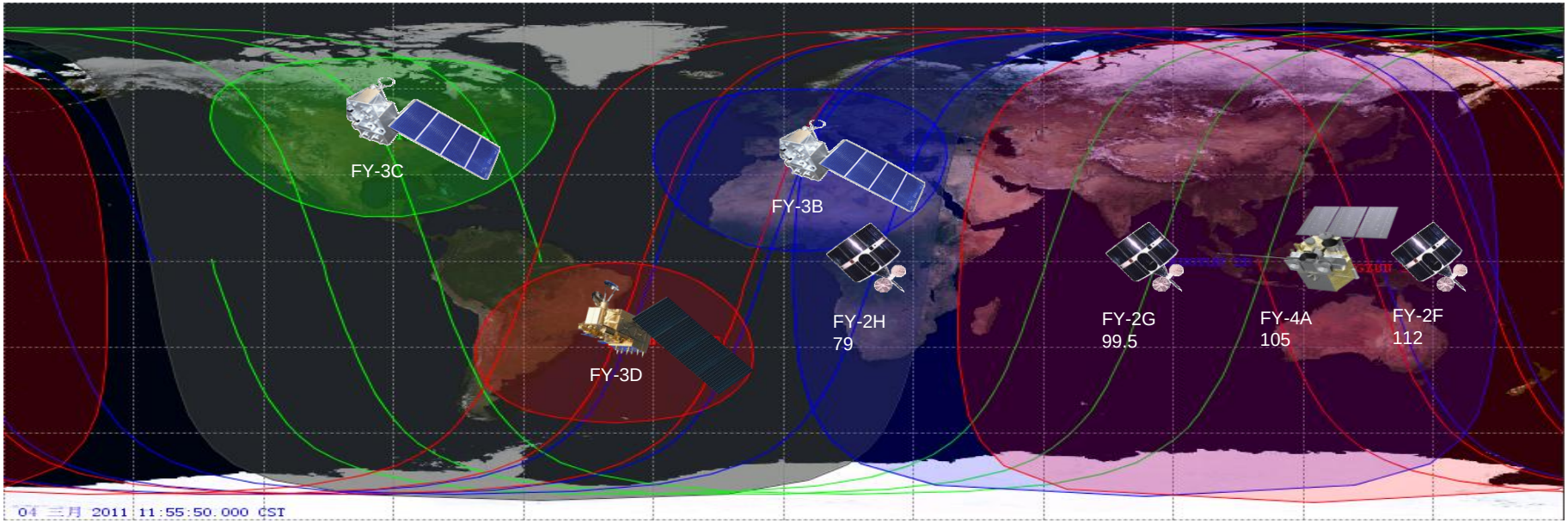


Table 1 Current FENG YUN Geostationary Satellites (as of March 1, 2021)

Satellite (status)		Location	Launch date	EO instruments			
FY-2F	(L)	112 E	2012-1-13	S-VISSR			
FY-2G	(Op)	105 E	2014-12-31	S-VISSR			
FY-2H	(Op)	79 E	2018-06-05	S-VISSR			
FY-4A	(Op)	104.7 E	2016-12-11	AGRI	GIIRS	LMI	SEP

Op = Operational
P = Pre-operational
B = Back-up, secondary
L = Limited availability

- Operational(or capable of)
- Operational with limitations(or Standby)
- Operational with Degraded Performance
- Not Operational
- Functional, Turned Off

Table 2 Current FENG YUN LEO Satellites (as of March 1, 2021)

Satellite (status)		Launch date	EO instruments					
FY-3B	(L)	2010-11-05	MERSI	VIRR	IRAS	MWTS	MWHS	MWRI
			SBUS	TOU	ERM	SIM	SEM	
FY-3C	(B)	2013-09-23	MERSI	VIRR	IRAS	MWTS	MWHS	MWRI
			SBUS	TOU	ERM	SIM	SEM	GNOS
FY-3D	(Op)	2017-11-15	MERSI	HIRAS	MWTS	MWHS	MWRI	IPM
			GAS	WAI	SEM	GNOS		

Space + Ground data services

By the year of 2020, many countries received Fengyun satellites data by varies means.

- Real-time data users established different kinds of satellite data direct broadcasting systems, including **20 CMACast stations**, **6 FY-2 DB stations**, and **2 FY-3 DB stations**.
- FY-3 pre-processing software packages have been free shared and installed in **25 countries**.
- **29 countries** registered as a member of **FY_ESM**.
- In 2020, CMA initiated **14 times emergency services** for other countries.
- The FY satellite data centre website users have expended to **115 counties** including more than **80 Belt and Road countries**.

Emergency services

From	2017	2018	2019	2020
FY_ESM	0	2	4	**6**
CHARTER/UN	0	4	5	**7**
China-GEOSS	2	3	2	**1**
Total	2	9	11	**14**

Space-based services

DB stations (GEO and LEO)
CMACast stations
FY-3 Preprocessing software packages

Applications

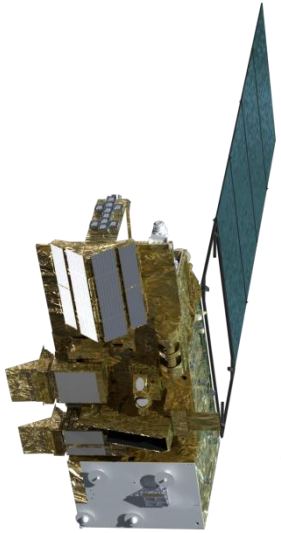
SWAP
SMART
Fengyun Wildfire Watch

Ground-based services

Type		User	Time	Services	Protocol
Intranet service		CMA main users	Real-time dataset	File access	NAS/FTP/ API
		CMA intranet users	Real-time dataset		
Website order		All user	All dataset	On-line order	HTTP
			Real-time dataset	Download	FTP
Customize order		Agreement user	All dataset	Customize	HTTP
Data client		All user	All dataset	On-line order	PC client
			Real-time dataset	Data subscribe	
Cloud service		All user	Real-time dataset	Data subscribe	Cloud client
Sub-service center		All user	Real-time dataset	On-line order	HTTP
API		All user	All dataset	API	API
Mobile	Fengyun live	Wechat user	Real-time FY-4 images	Wechat	Wechat applet
	Fengyun Earth View	Wechat user	FY-3D images in a week	Wechat	Wechat applet

Coordination Group for Meteorological Satellites - CGMS

FY-3E



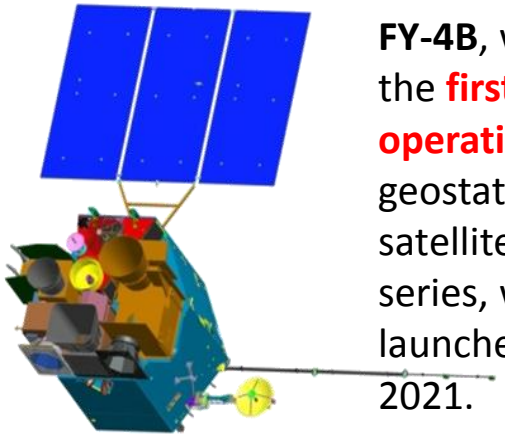
FY-3E, which is the **first early-morning orbit** satellite in China's polar-orbiting meteorological satellite family, is scheduled to be launched in July, 2021.
Its local time at descending node is 5:30 AM.

4 characteristics of FY-3E:

- **High-precision optical microwave combined** atmospheric temperature and humidity vertical distribution detection capability;
- **Active remote sensing instrument** wind field accurate detection capability;
- High-efficiency global optical imaging observation capability with **250-meter resolution**;
- Comprehensive detection capability of the **sun and space environment**.

No.	Instruments	Statues
1	Dual-frequency wind radar (WindRAD)	**new**
2	Solar spectral irradiance monitor (SSIM)	
3	Solar X-EUV Imagers (XEUVI)	
4	MERSI-L	**improved**
5	MWTS-III	
6	HIRAS-II	
7	GNOS-II	
8	SIM-II	
9	SEM	
10	Tri-IPM	
11	MWHS-II	**inherited**

FY-4B

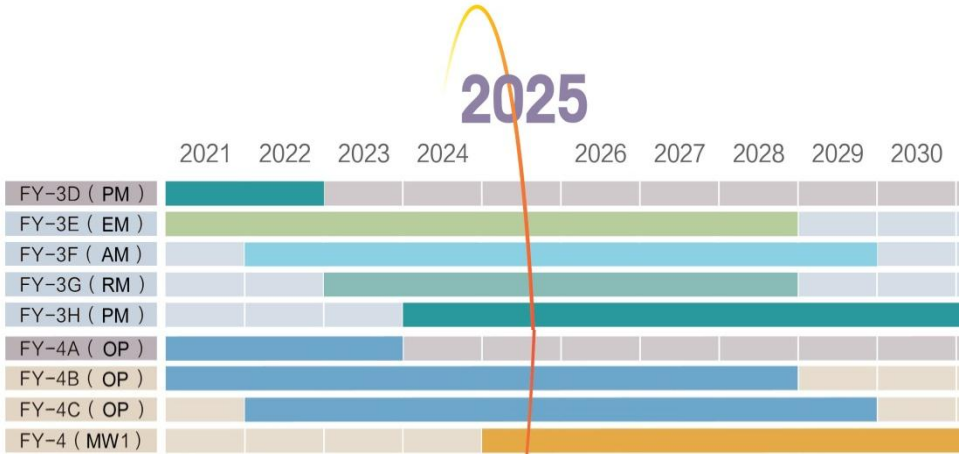


FY-4B, which is the **first operational** geostationary satellite in FY-4 series, will be launched in May, 2021.

- The main observation capabilities are similar to those of FY-4A, with some significant performance improvements.
- It will be probably positioned at a **123.5° E** to continue operations as a main operational geostationary meteorological satellite.

	Instruments
1	Advanced Geostationary Radiation Imager(AGRI)
2	Geostationary Interferometric Infrared Sounder(GIIRS)
3	Geostationary High Speed Imager(GHI)
4	Space Environment Package(SEP)

Future Fengyun Satellite Systems

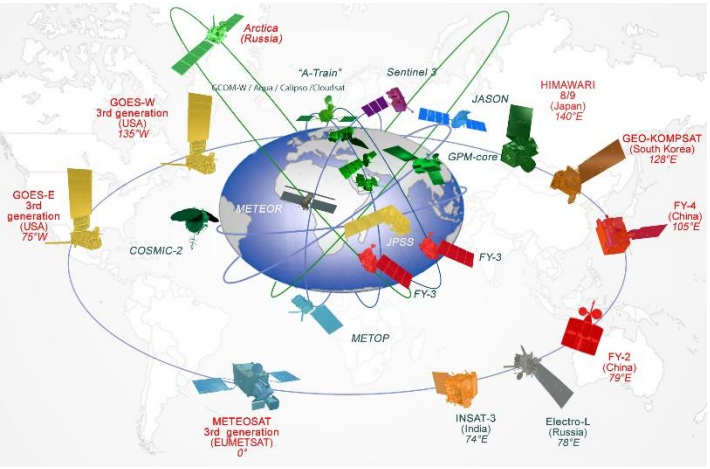


Fengyun Satellite Projects by 2025

- 4 FY-3 polar-orbiting satellites to be launched, which will be arranged by the layout of three solar synchronous polar-orbiting satellites in early-morning, mid-morning and afternoon, and one precipitation measurement satellite in inclination orbit by 2025.
- 2 FY-4 GEO optical satellites to be launched.
- 1 FY-4 GEO microwave satellite to be launched.

Fengyun Programme by 2035

FY-5 research satellite	third-generation LEO meteorological satellite
	Using a new large satellite platform
	Inherit the main operational capabilities of FY-3
	It is in the morning orbit.
FY-5 operational satellites	Including early-morning, morning, afternoon and maneuvering orbit,
	life 10 years
Radiometric benchmark mission	By 2035 ， 1 satellite in polar orbit.
FY-4 patch 03 &	FY-4 patch 03 including 3 satellites FY-4D/E/F
FY-4 MW	FY-4 operational MW satellite to be launched in next 10 years
FY-6 research satellite	third-generation GEO meteorological satellite
	Inherit the main operational capabilities of FY-4



Thanks for your attention.