SWAP application of integrated CMACast System

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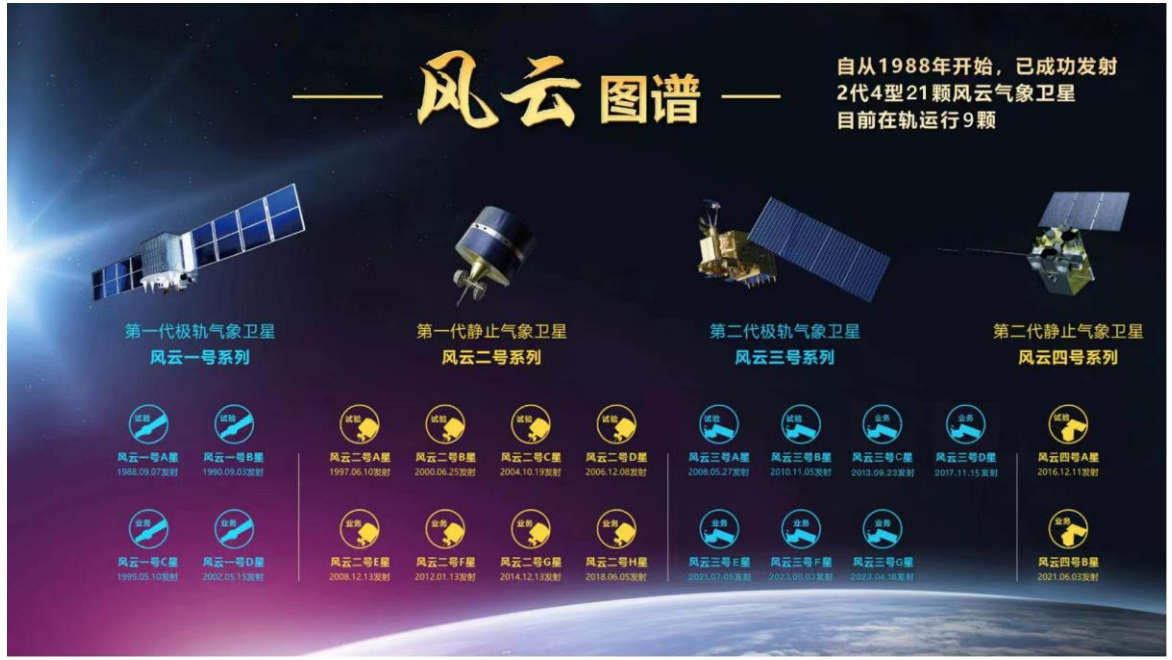
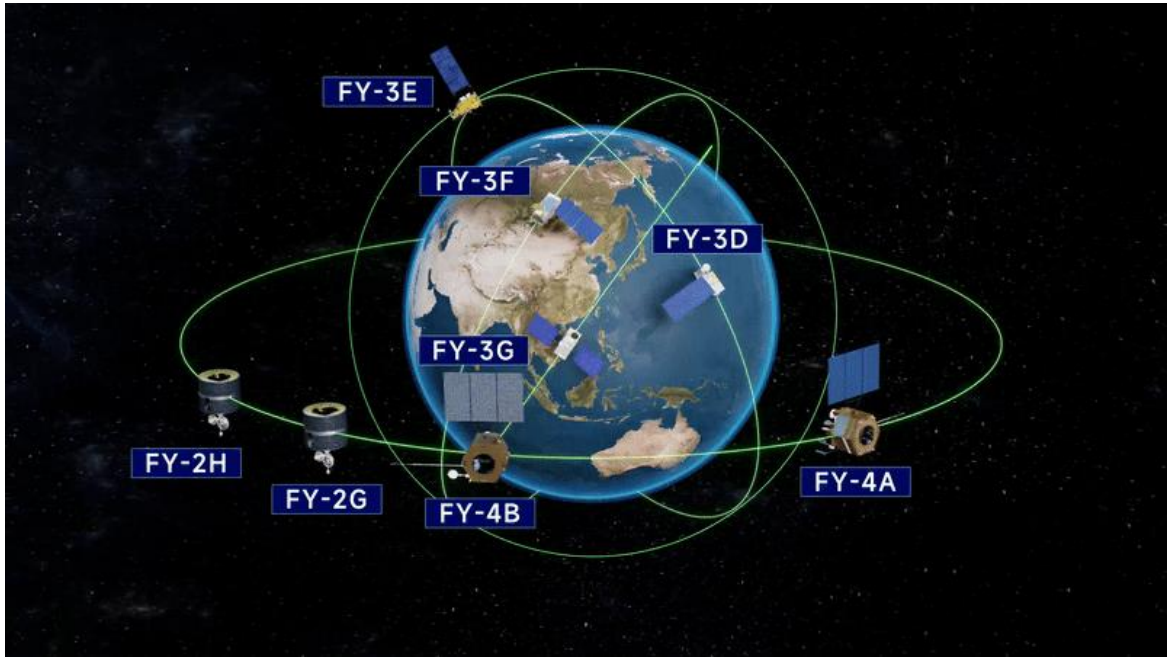
FengYun Series Satellites: Wide Coverage High Precision Full Quantification

- 极轨序列：上午、下午、晨昏、倾斜四类不同时段轨道
  Polar orbit satellite series: four different orbits: early morning, morning, afternoon, and inclination orbit
- 静止序列：在轨备份、适时加密、东西布局
  Geostationary satellite series : in orbit backup, timely intensified observation, east-west layout
- 已发射2代4型21颗，在轨运行8颗，实现覆盖全球、高精度、全定量的系列化、业务化自主发展
  21 satellites, two generations and four types. Currently, there are 8 FengYun satellites in orbit, achieving global coverage, high precision, and full quantitative serialization and operational oriented independent development



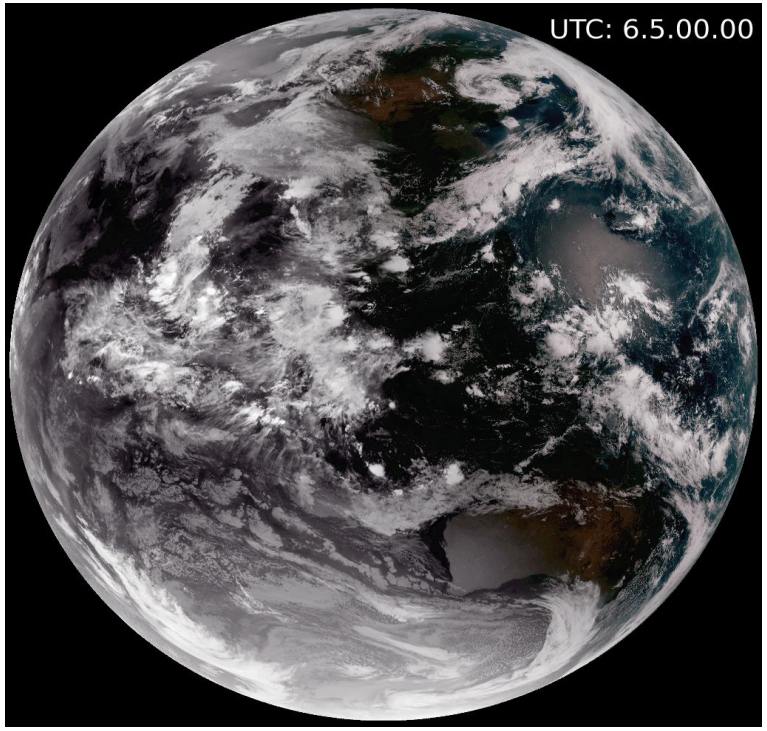


Polar Orbit and Geostationary Series Complement Each Other

静止气象卫星观测特点（哨兵）

1. 轨道高度约35800公里，可每15分钟获取一张地球全圆盘图
2. 可进行区域快速观测，最高分辨率1分钟、250米分辨率

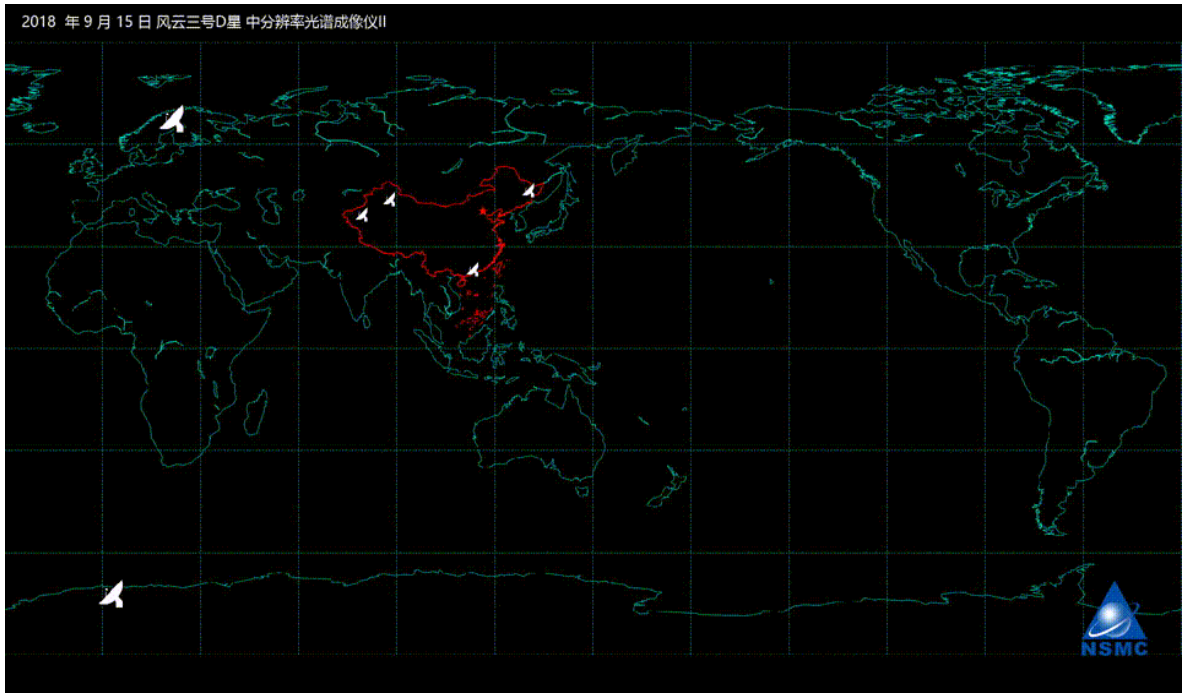
1. Obit altitude is about 35800 km, and a full disk map can be obtained every 15 minutes
2. Rapid regional scan with 250 meters resolution at 1 minute interval



极轨气象卫星观测特点（巡逻兵）

1. 在约800公里轨道高度绕地球南北极飞行，每12小时无缝隙覆盖全球
2. 搭载多种遥感仪器，获取大气和地球环境综合探测信息

1. Fly around the Earth's North and South Poles at the orbital altitude of approximately 800 km, covering the globe seamlessly one time every 12 hours.
2. Equipped with multiple remote sensing instruments to obtain comprehensive information of the atmosphere and environment.



Outline

Platforms

- SWAP stand-alone version
- SWAP web version

Application

- FengYun EARTH
- FY_ESM
- Data Sharing
- User Conference

Platforms：SWAP

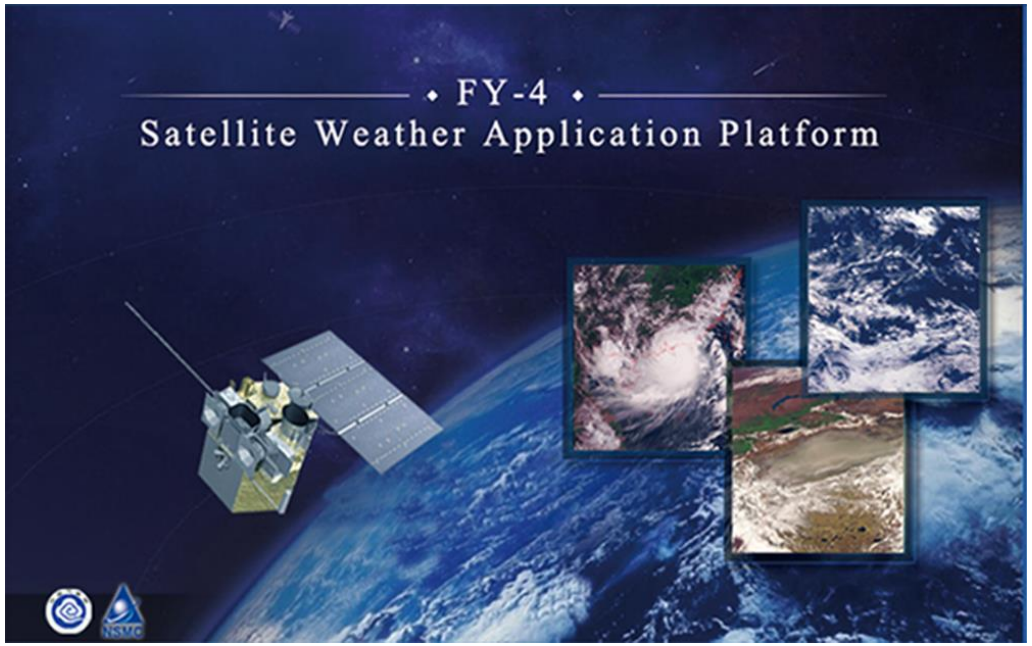
Cloud Platform for Geostationary Satellites

Main User: **Meteorologist**

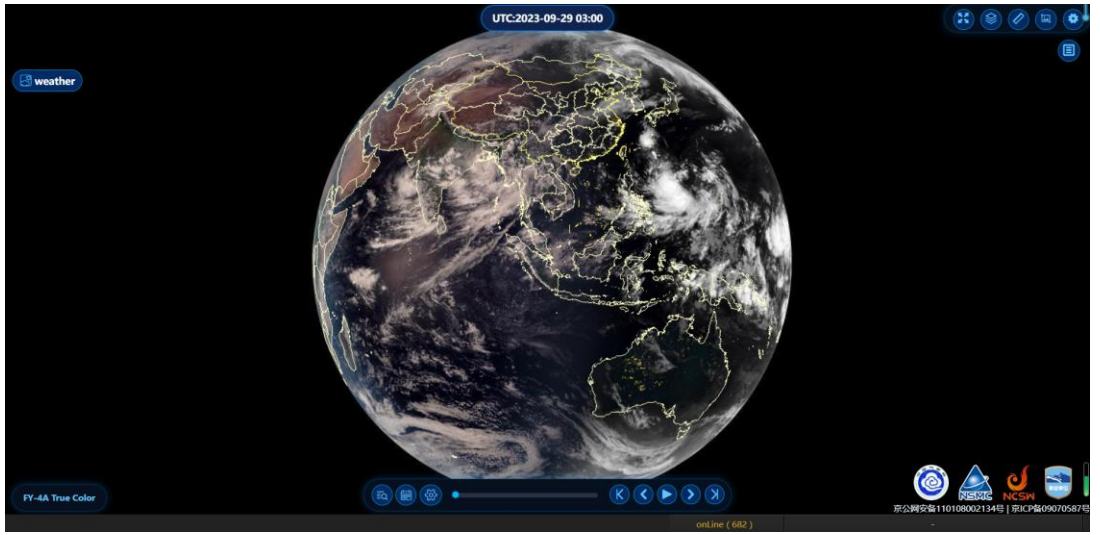
Typical Applications: **Tropical Cyclone, Convection, Fire, etc.**

SWAP (FengYun Satellite Weather Application Platform) is **implemented with BS** (Browser Service) architecture and accessed through web browser.

SWAP has the ability of **rendering single/multiple channel composites**, and **overlaying L2 products**.



Satellite Weather Application Platform - SWAP



Weather monitoring and analysis
---Geostationary Satellite data (FY-2/FY-4)

Platforms：SWAP （stand-alone version）

Data Access

- Provincial CMACast default folder structure support
- Provincial direct receiving station HRIT format support
- Custom data access with configuration file
- System file selector and manual file selection support

Comprehensive FY4 and FY2 satellite data display

- Nominal geostationary satellite coordinate system support
- Single-frame cloud atlas and multi-frame animation support
- Flexible channel toggle and layer management
- Single channel pseudo-color enhancement with specific color map
- L2 data overlay display
- Cloud atlas animation file export
- FY-4A true color composite

Thematic application

Strong convective system interactive analysis

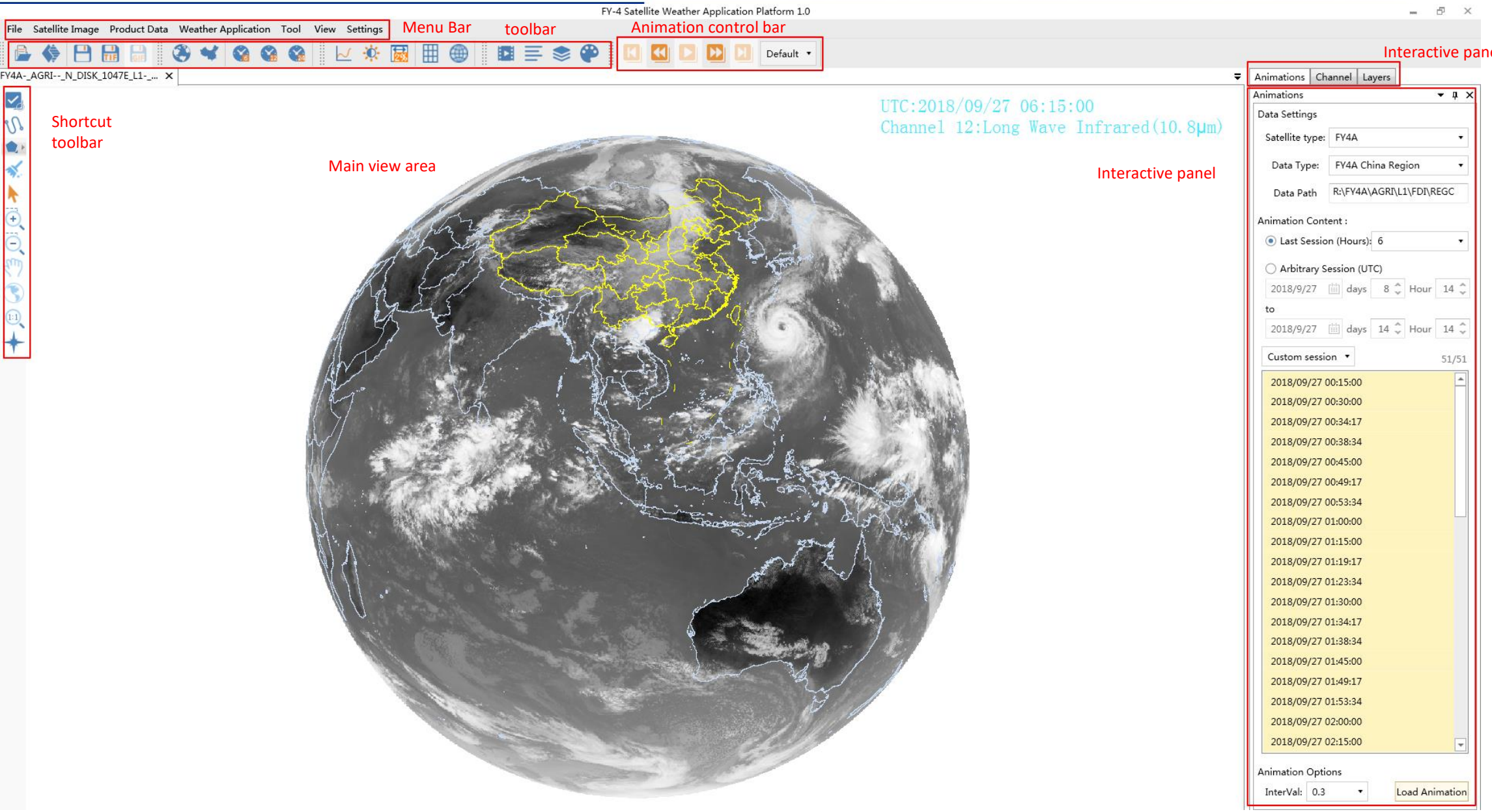
- Default and manual ROI selection
- Interactive parameter configuration, real time analysis result display

Cyclone positioning and intensity estimation

- Pixel level positioning and inverse positioning based on cloud atlas
- Interactive point selection and spiral fitting
- Spiral parameter adjustment

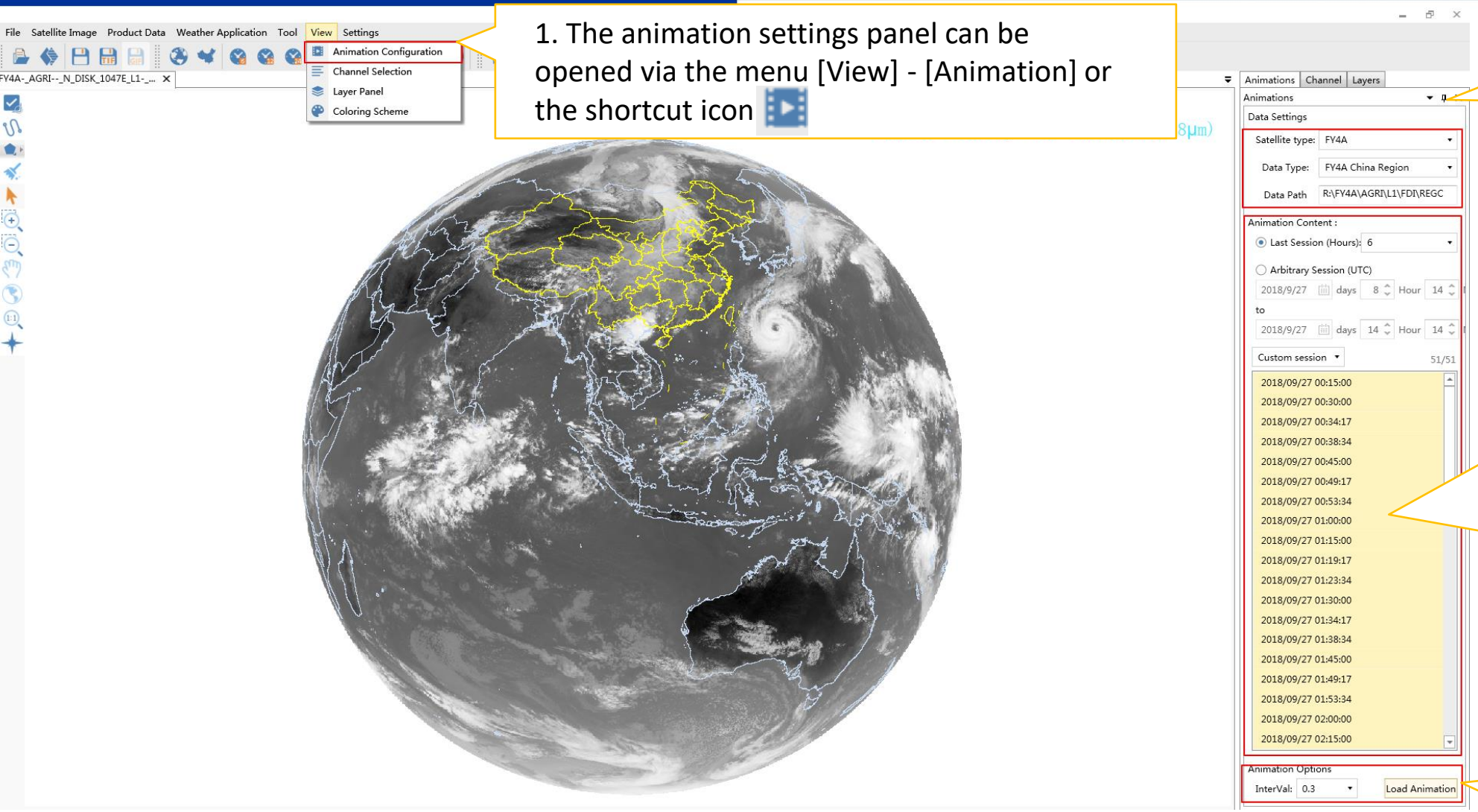
Platforms: SWAP

Interface layout



Platforms: SWAP

View panel introduction: animation settings panel



1. The animation settings panel can be opened via the menu [View] - [Animation] or the shortcut icon

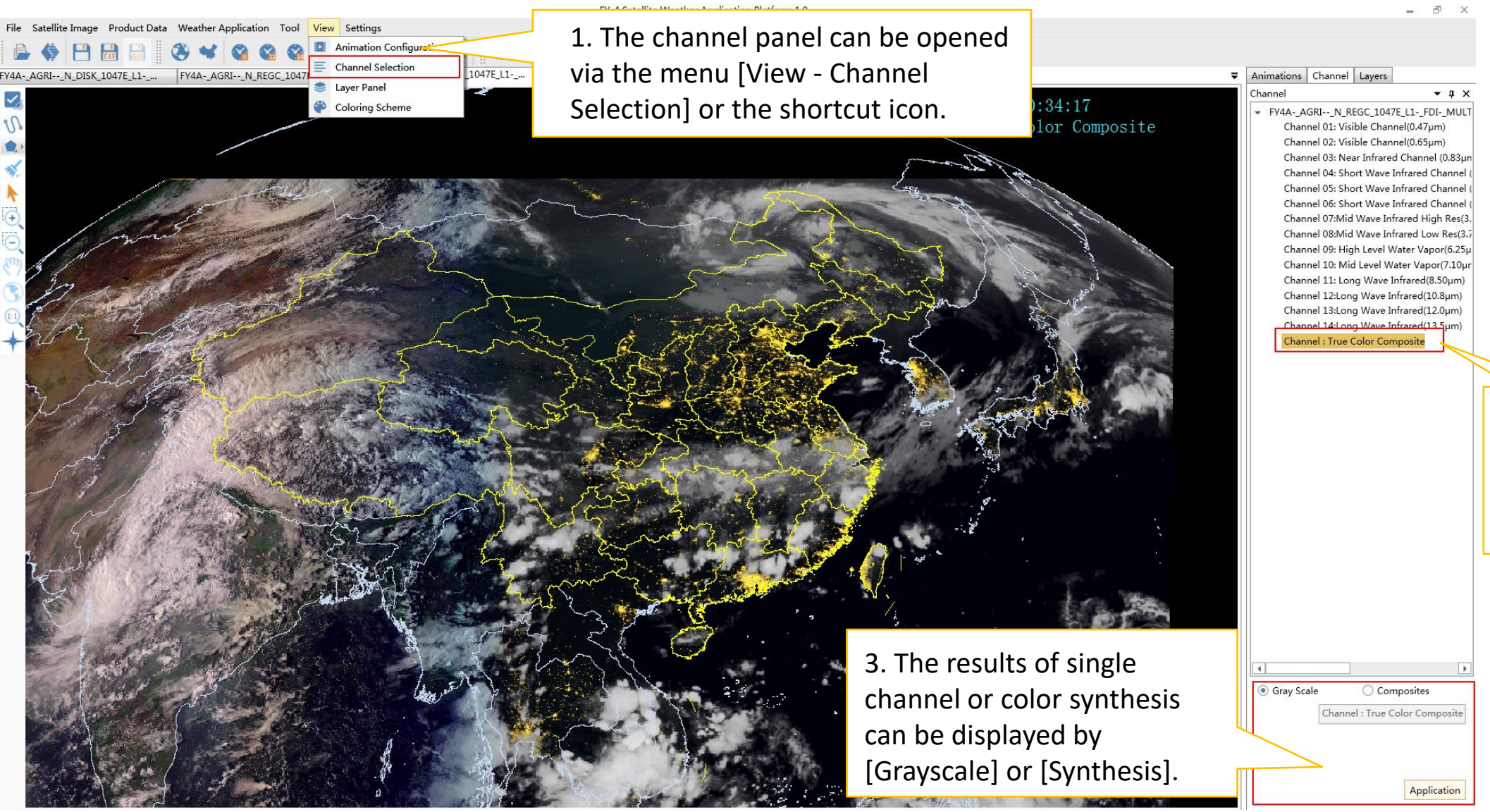
2. Select the configured data type by using the drop-down box in [Data Type].

3. The latest time period data can be selected through the drop-down box; custom time period data is selected; the data is customized to manually select the files in the list.

4. Set the animation interval and click the button [Animation Load] to create the animation.

Platforms： SWAP

View panel introduction: channel selection panel



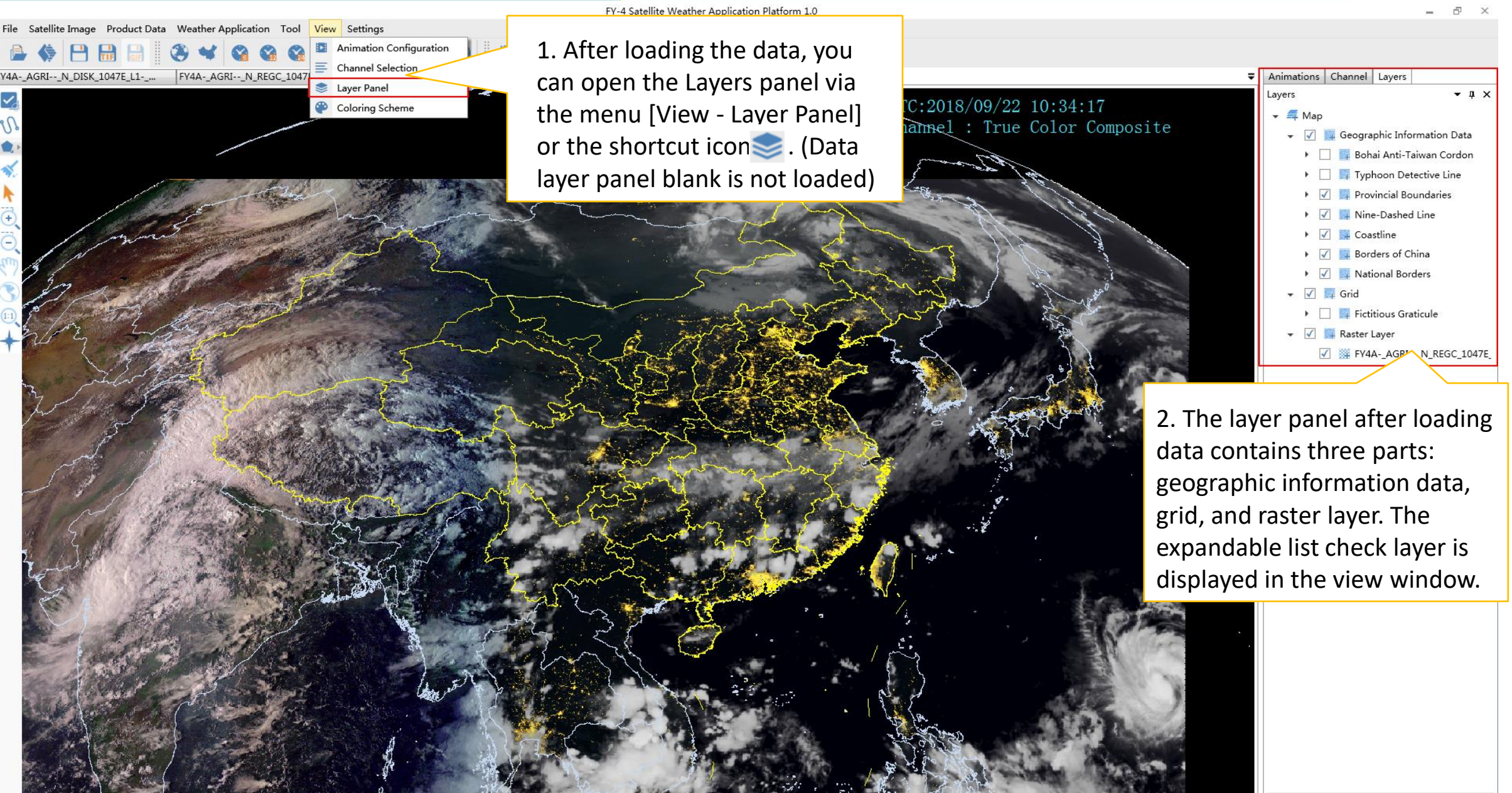
1. The channel panel can be opened via the menu [View - Channel Selection] or the shortcut icon.

2. Support true color cloud overlay display

3. The results of single channel or color synthesis can be displayed by [Grayscale] or [Synthesis].

Platforms: SWAP

View panel introduction: Layer panel

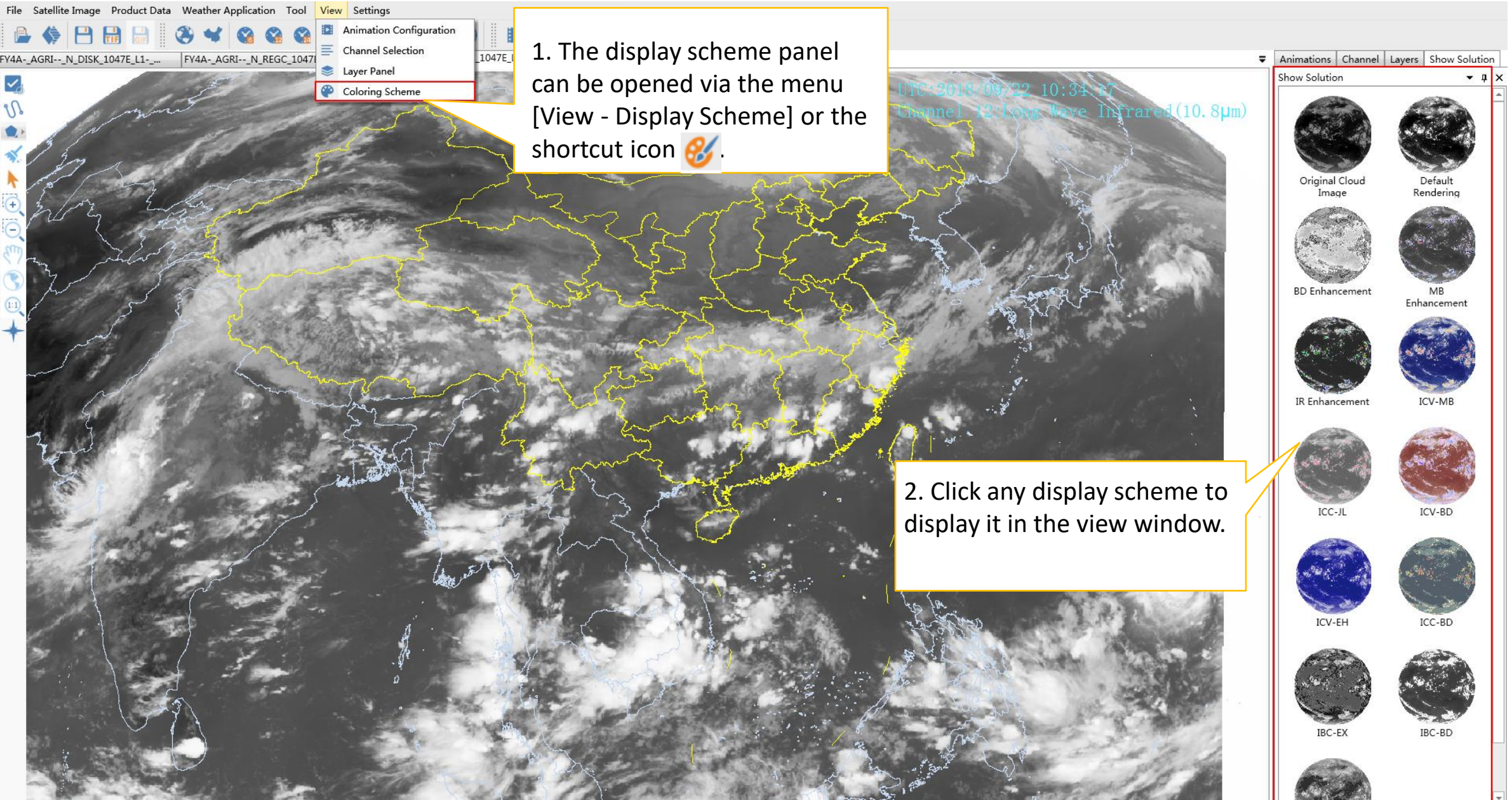


1. After loading the data, you can open the Layers panel via the menu [View - Layer Panel] or the shortcut icon . (Data layer panel blank is not loaded)

2. The layer panel after loading data contains three parts: geographic information data, grid, and raster layer. The expandable list check layer is displayed in the view window.

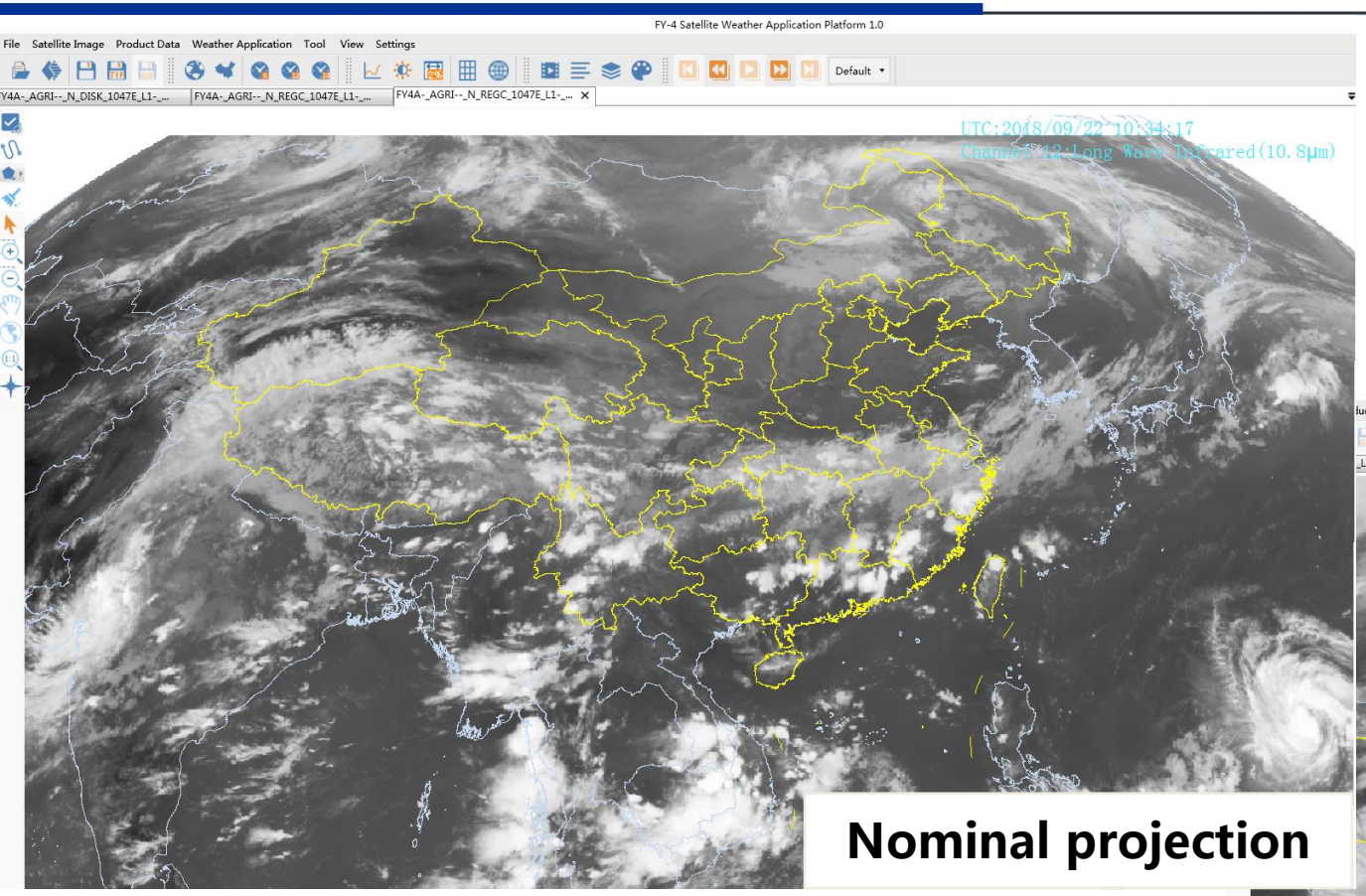
Platforms: SWAP

View panel introduction: display scheme panel

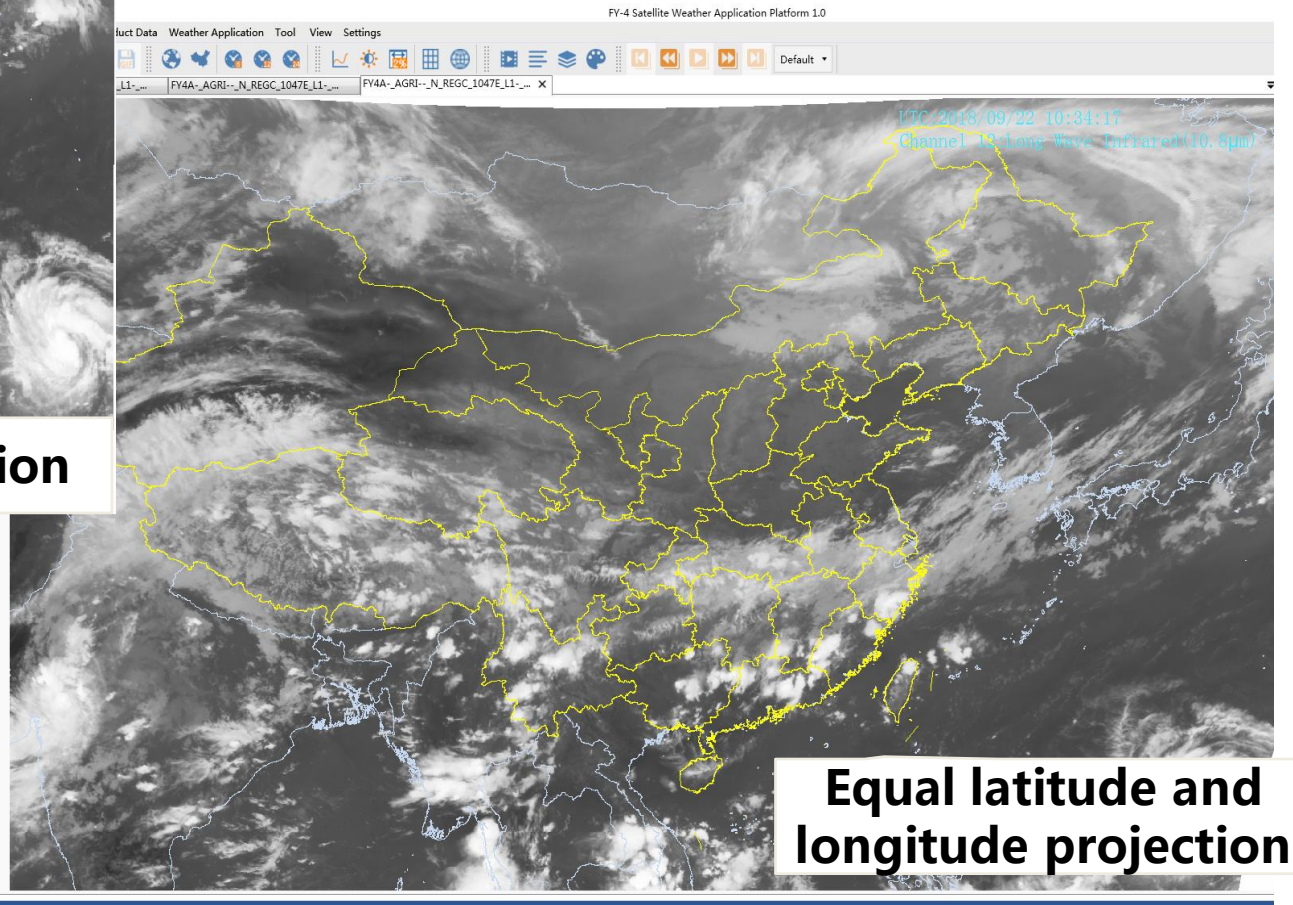


Platforms: SWAP

Dynamic switching of multiple projection modes



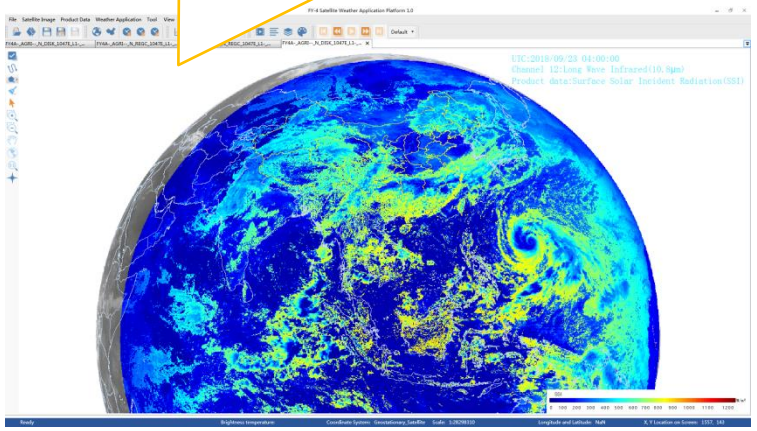
Nominal projection



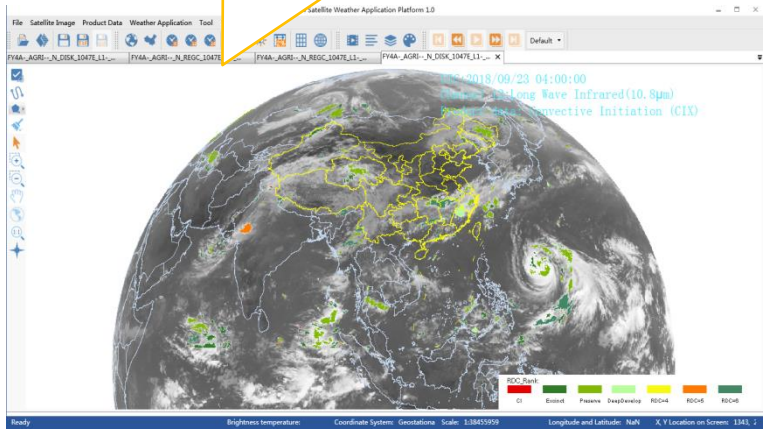
Equal latitude and longitude projection

Platforms: SWAP

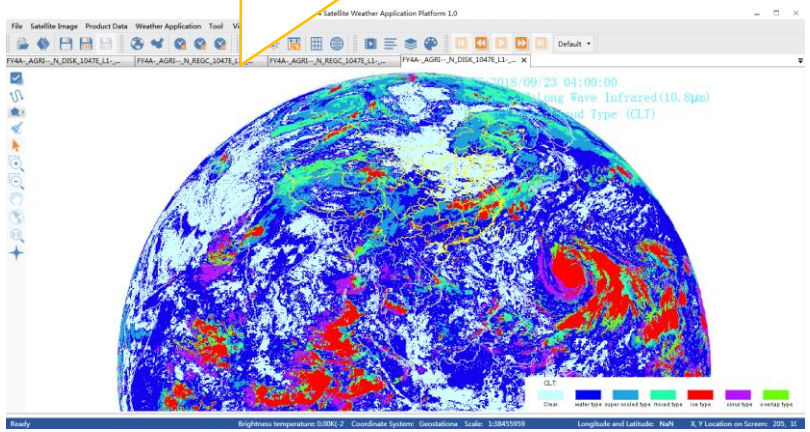
SSI Surface solar incident radiation



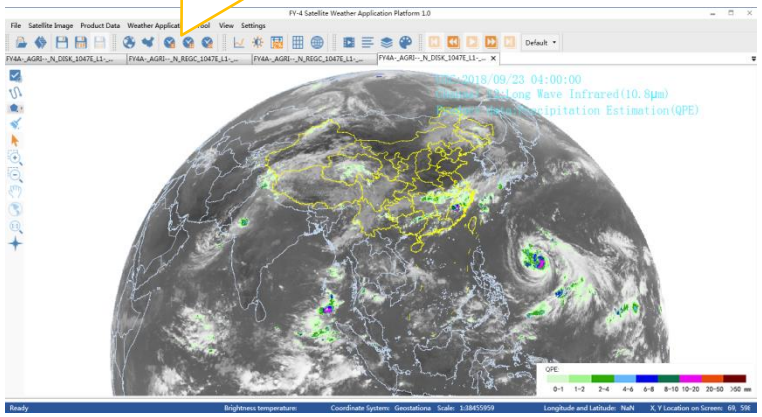
CIX Convection



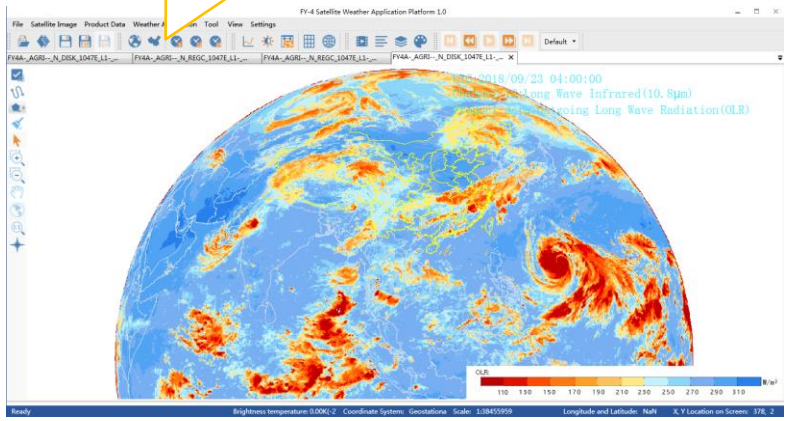
CLT Cloud type



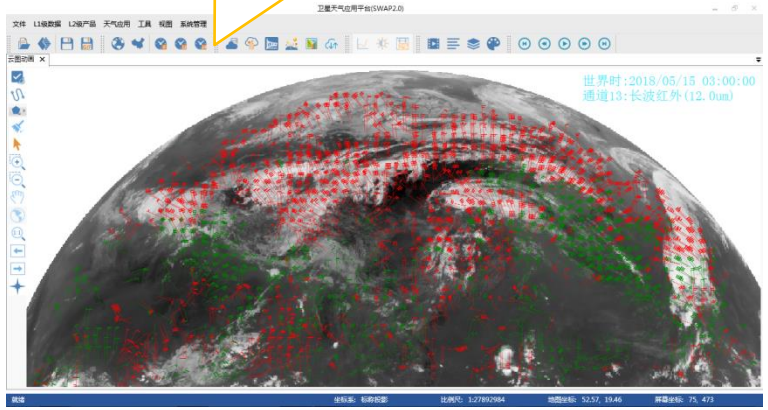
QPE



OLR Long-wave radiation

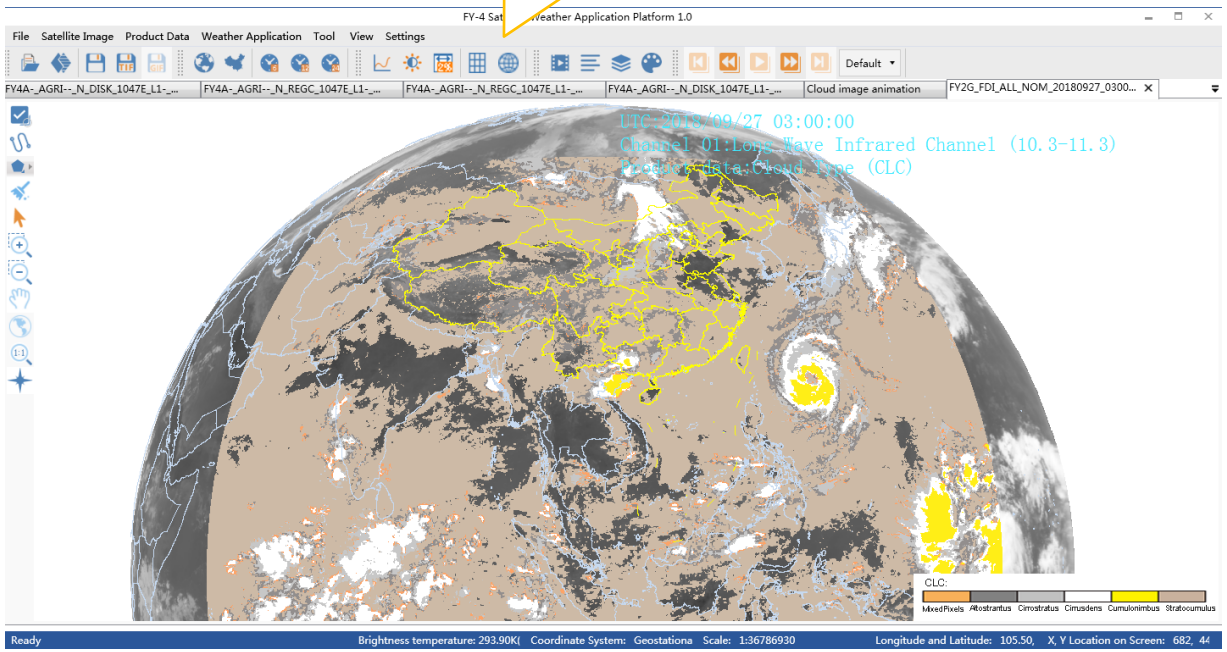


AMV



Platforms: SWAP

CLC Cloud type



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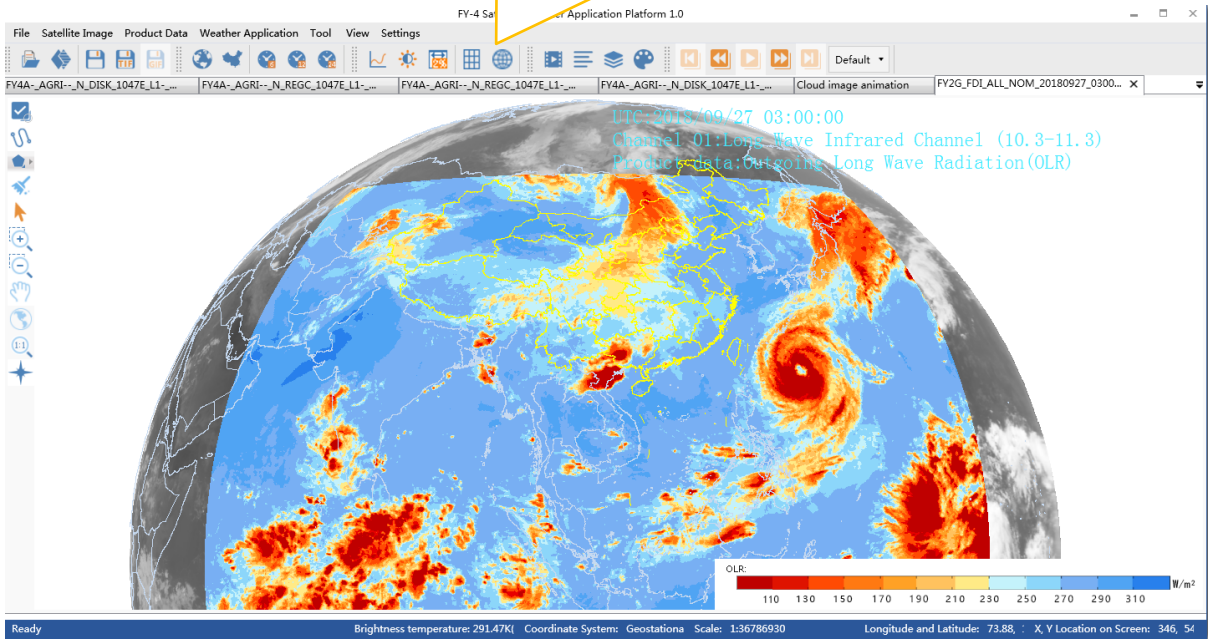
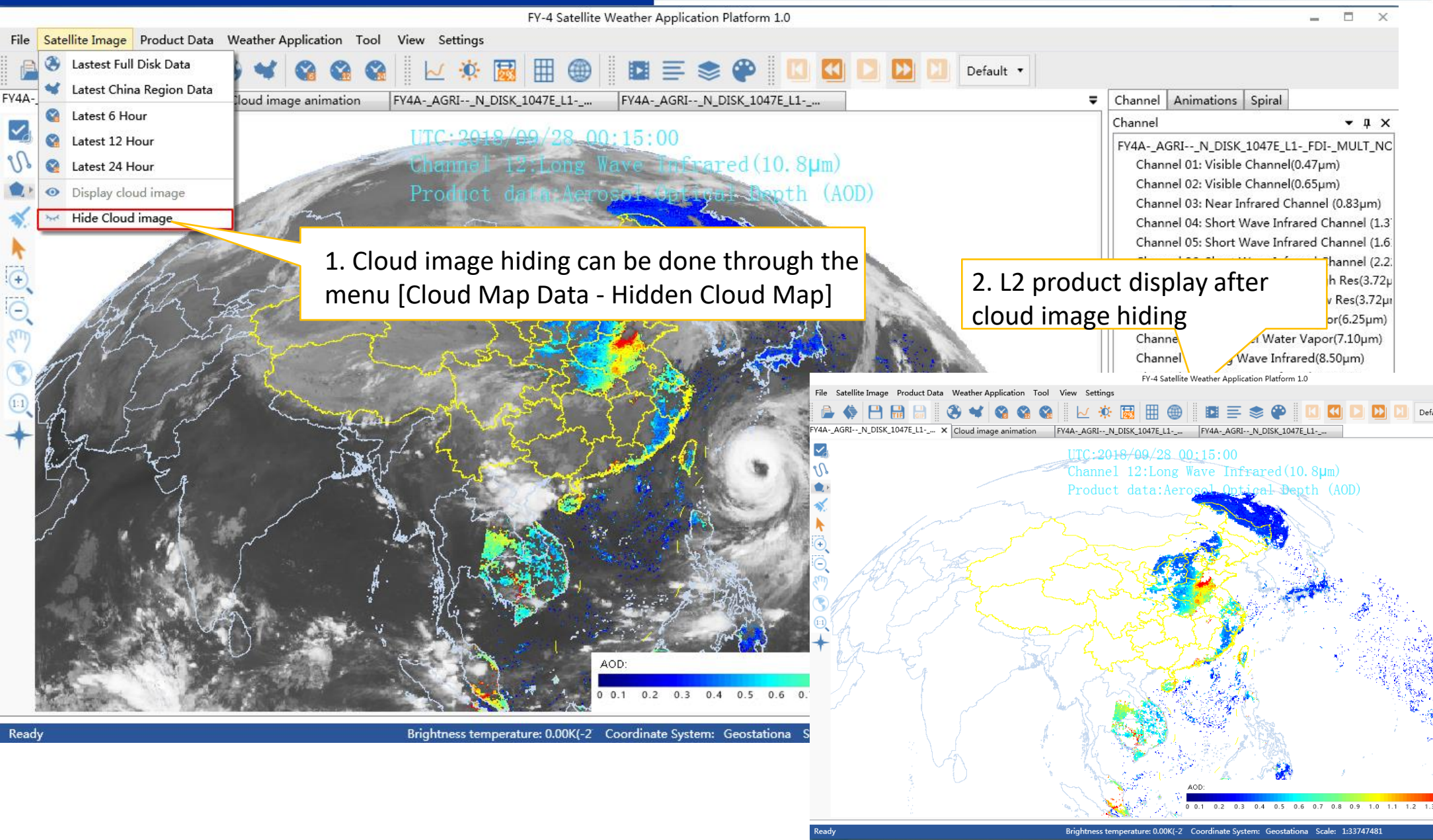


Platforms: SWAP



1. Cloud image hiding can be done through the menu [Cloud Map Data - Hidden Cloud Map]

2. L2 product display after cloud image hiding

Platforms：SWAP

Output save

Animated GIF format save

Click the menu bar [File - Save GIF Animation] or click the shortcut icon 

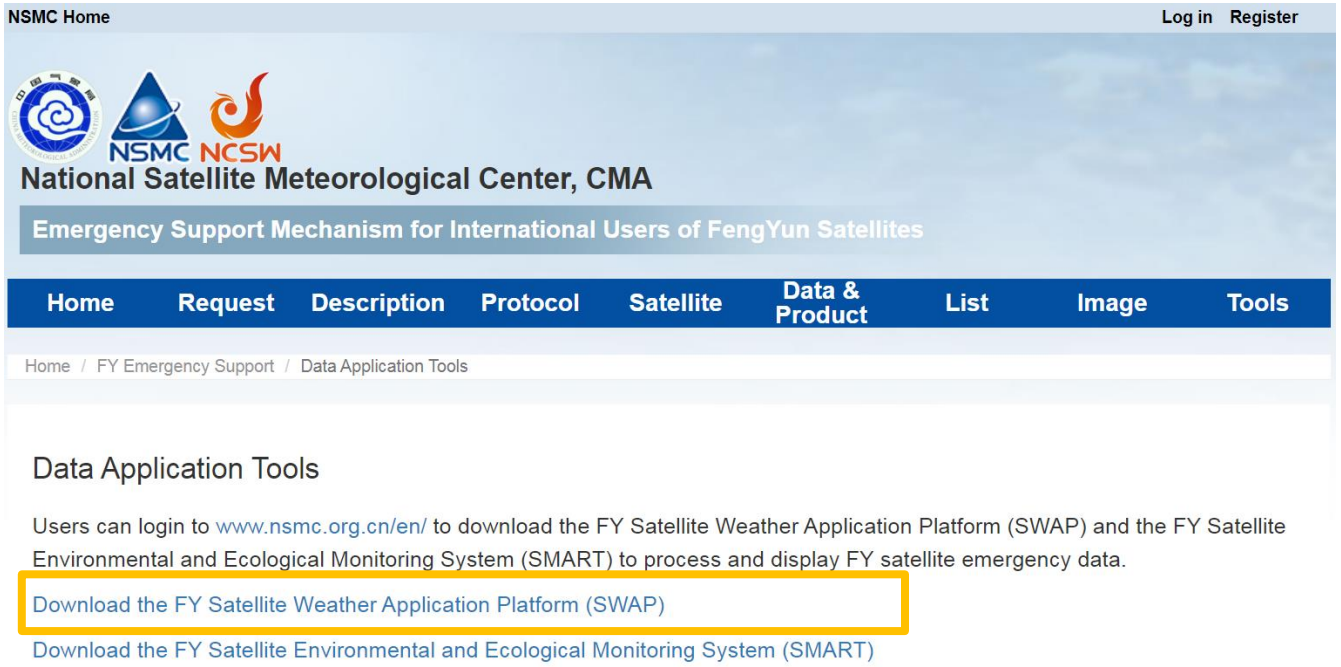
to select the file path; Click [Apply] to save the parameter configuration.

Picture save

Click the menu bar [File - Save Picture] or click the shortcut icon  to select the file path; Click [Apply] to save the parameter configuration. (Save as a set of images in an animated scene; save a single image in a non-animated scene.)

Platforms: SWAP

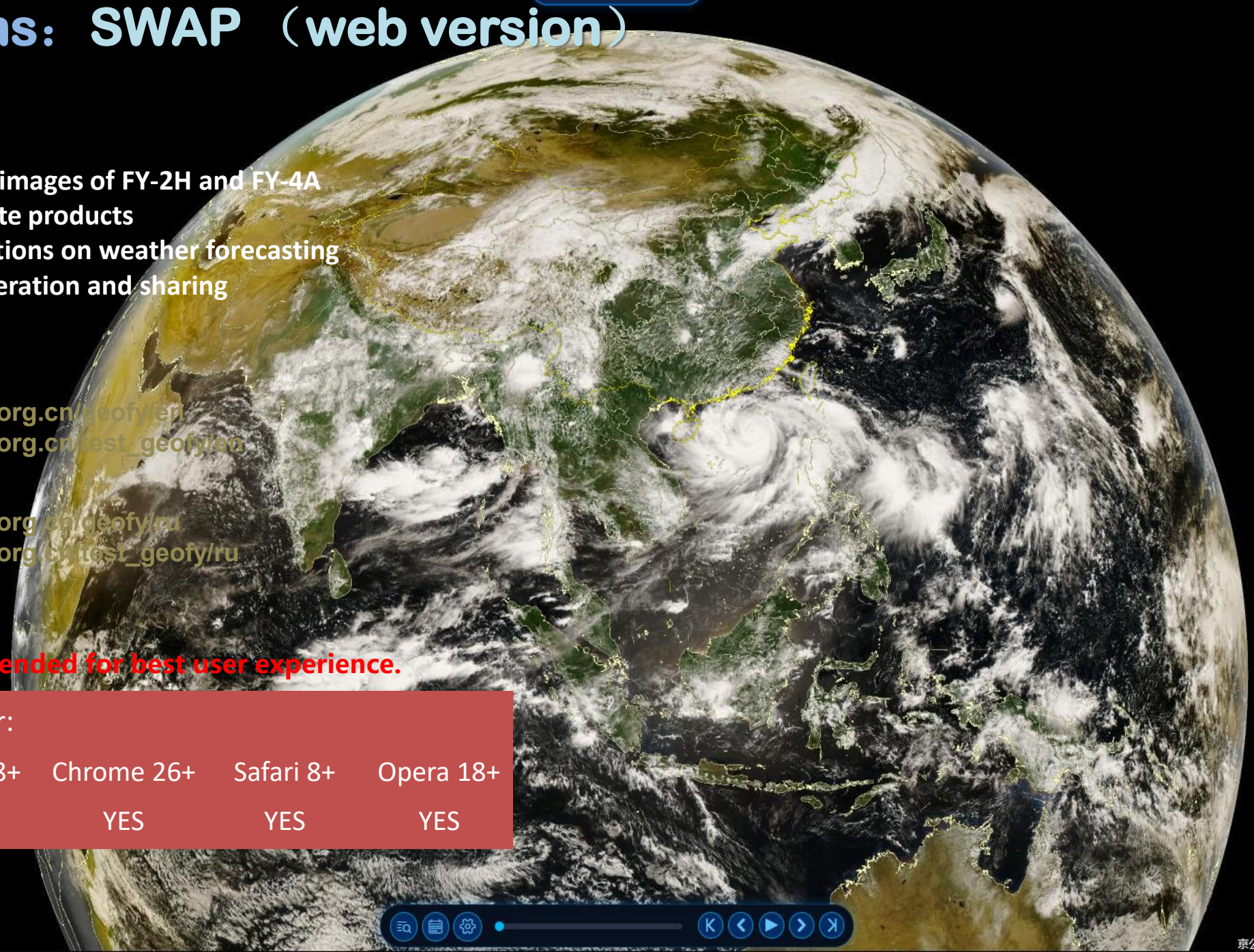
Users can login to www.nsmc.org.cn/en/ to download the FY Satellite Weather Application Platform (SWAP)



SWAP

http://www.nsmc.org.cn/service/en/emergency/tools.html

Platforms：SWAP （web version）



Main functions

- Near real-time images of FY-2H and FY-4A
- 30+ GEO satellite products
- Special applications on weather forecasting
- Animation generation and sharing

- **English**

http://rsapp.nsmc.org.cn/geofy/en
http://rsapp.nsmc.org.cn/test_geofy/en

- **Russia**

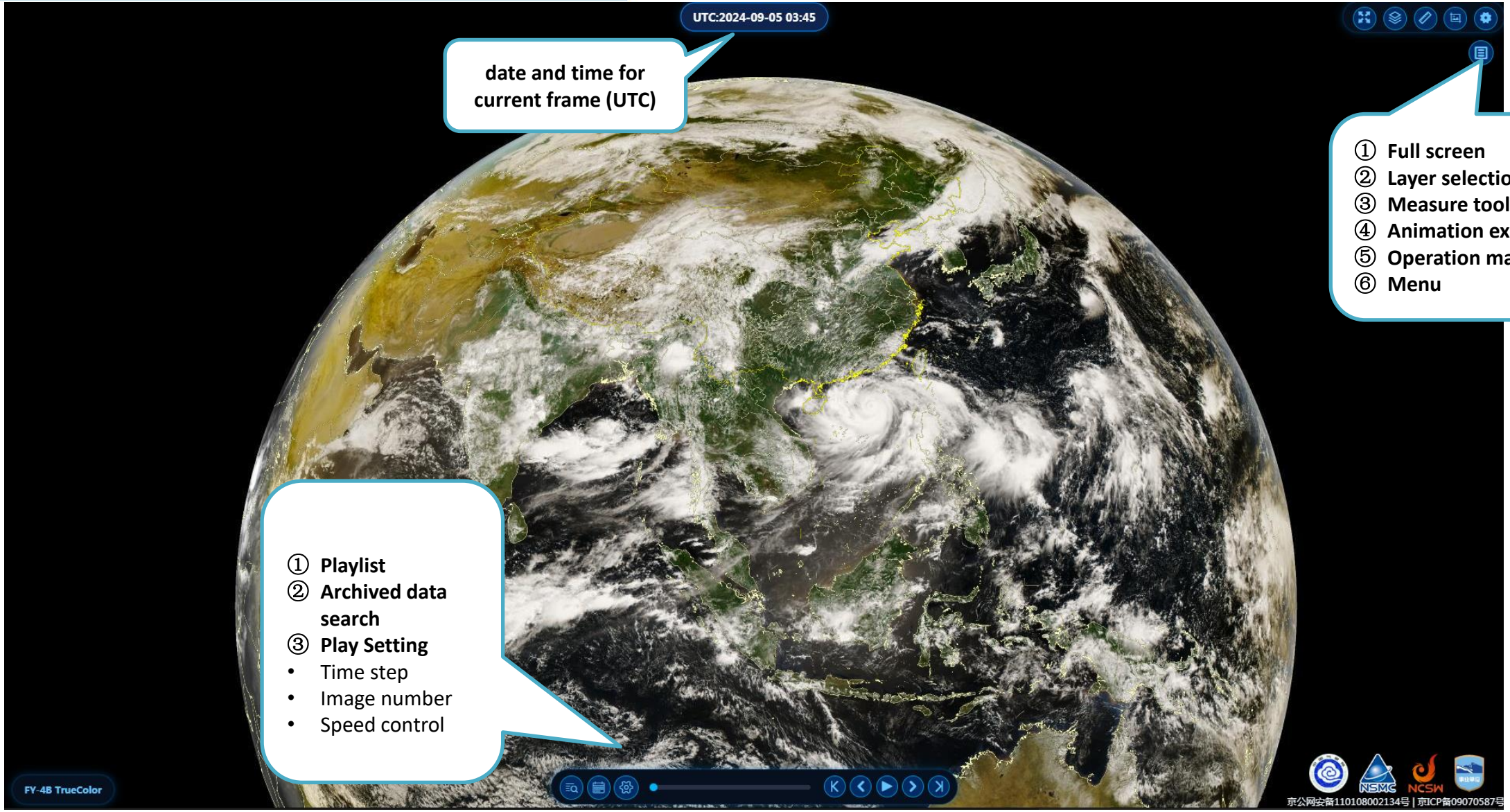
http://rsapp.nsmc.org.cn/geofy/ru
http://rsapp.nsmc.org.cn/test_geofy/ru

Chrome is recommended for best user experience.

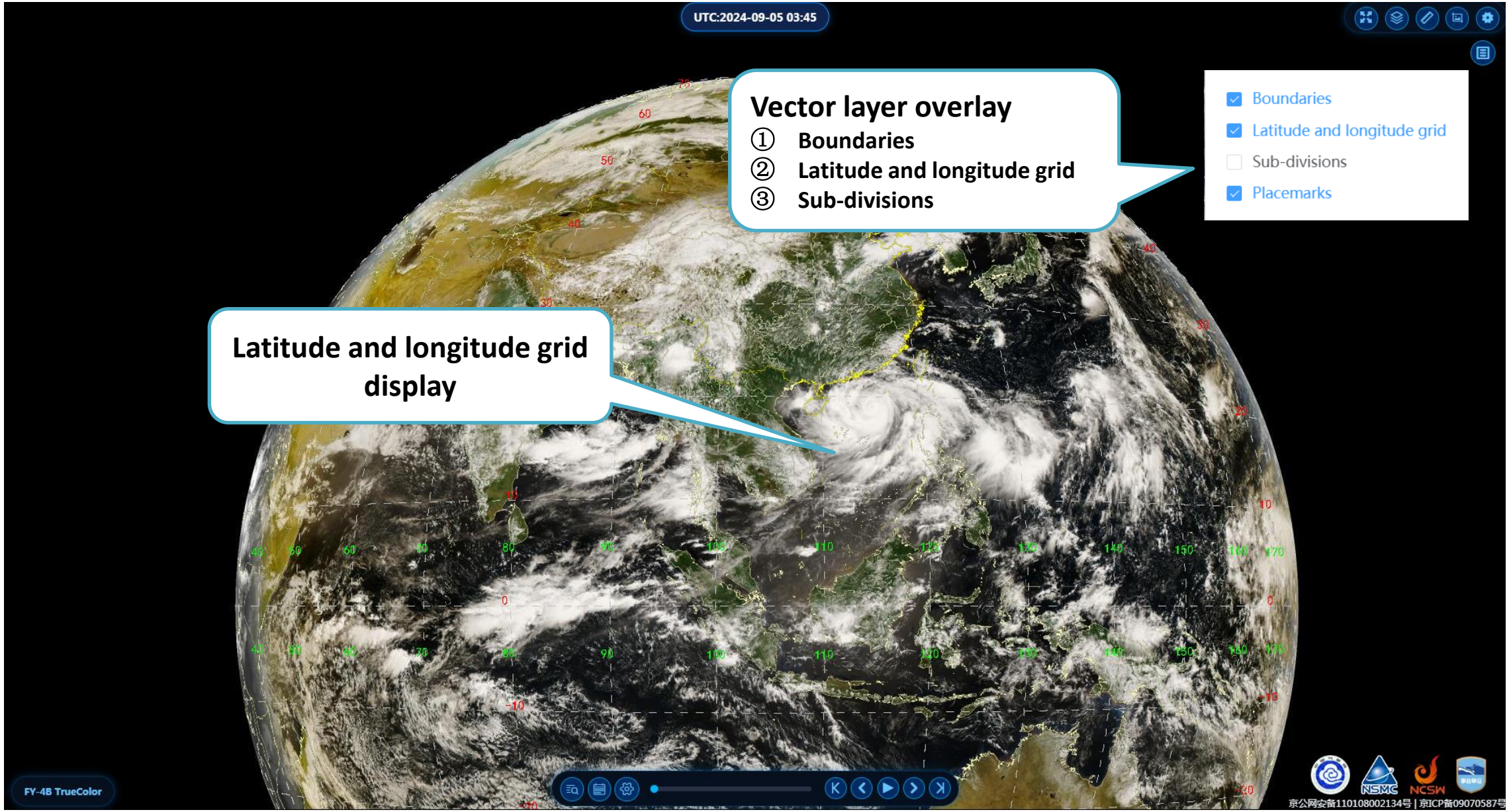
Supportted browser:

IE 10+	Edge 18+	Chrome 26+	Safari 8+	Opera 18+
YES	YES	YES	YES	YES

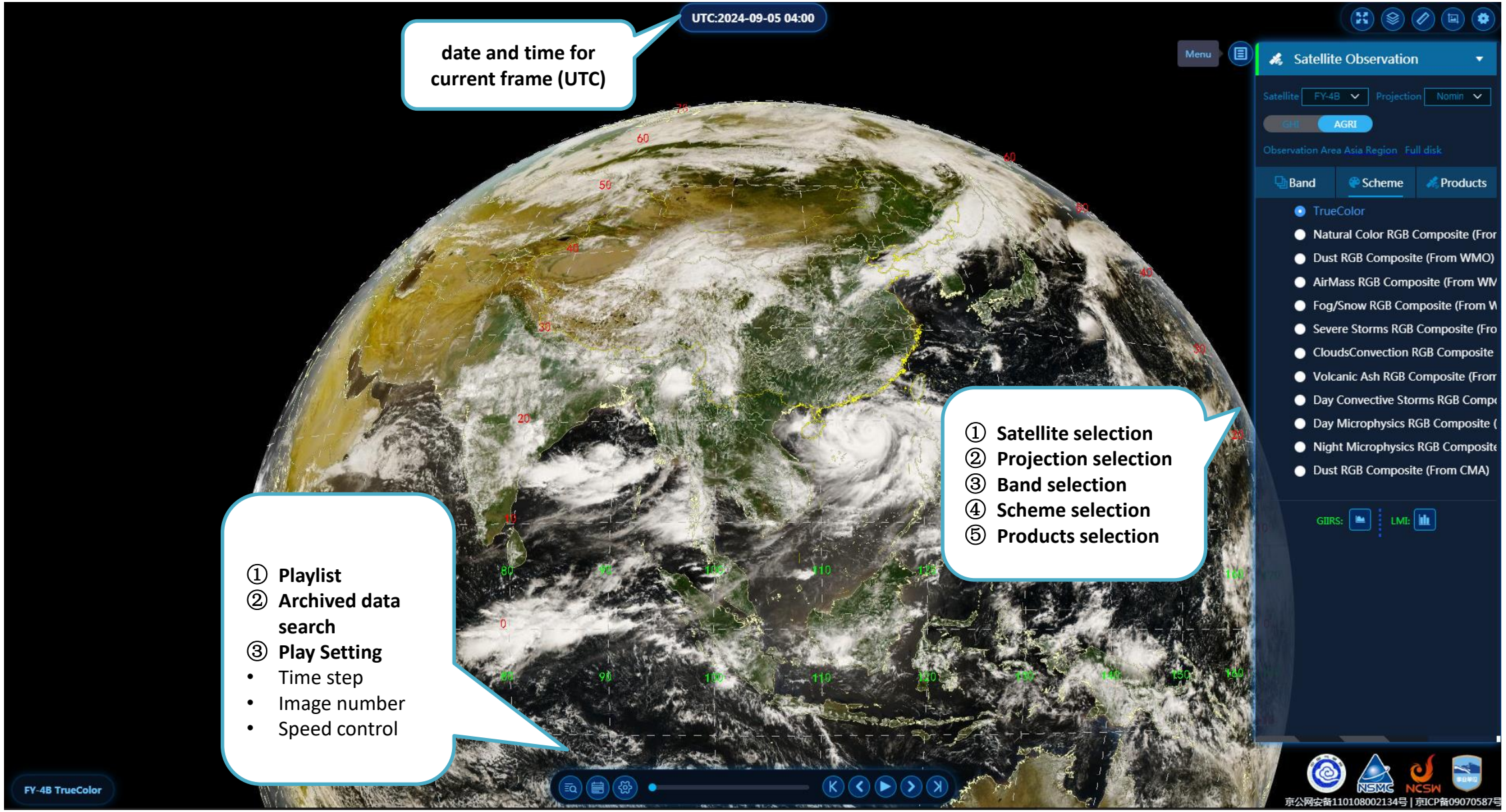
Platforms： SWAP



Platforms： SWAP

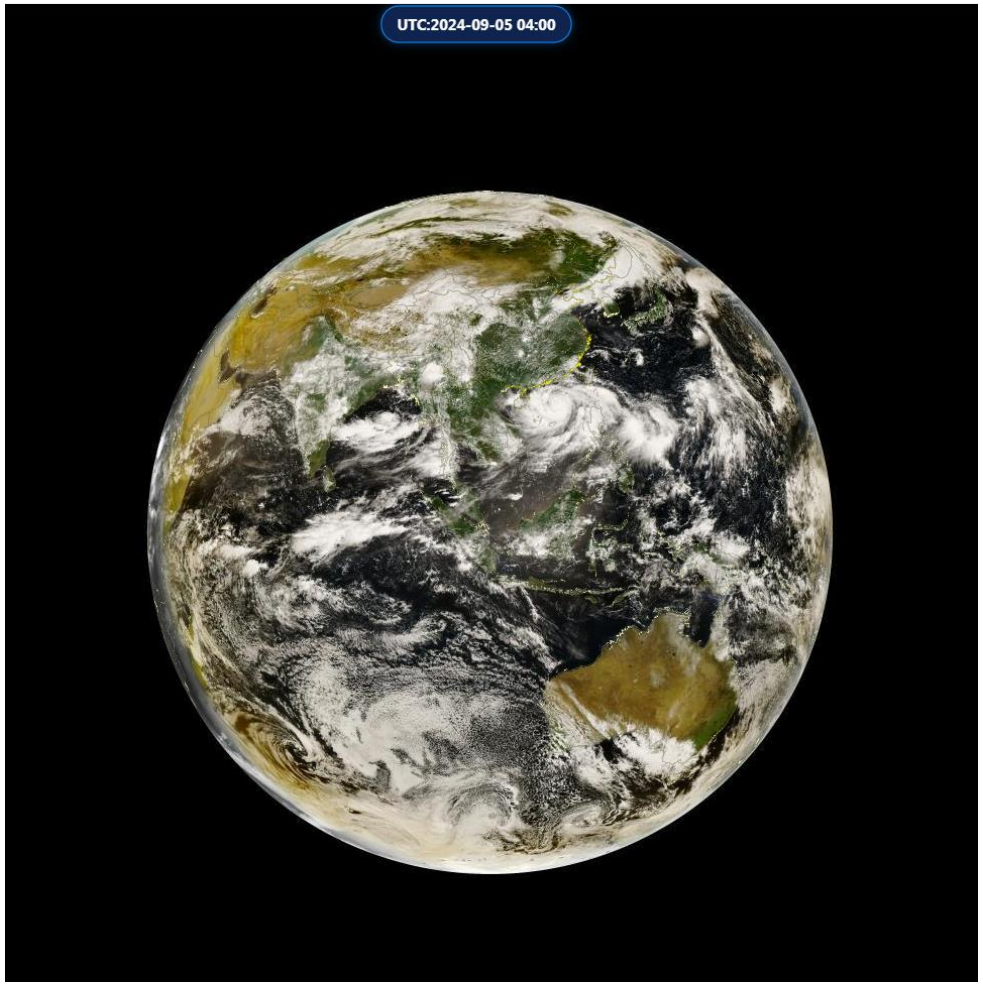


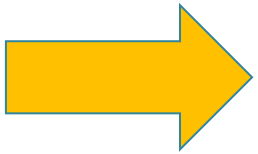
Platforms: SWAP

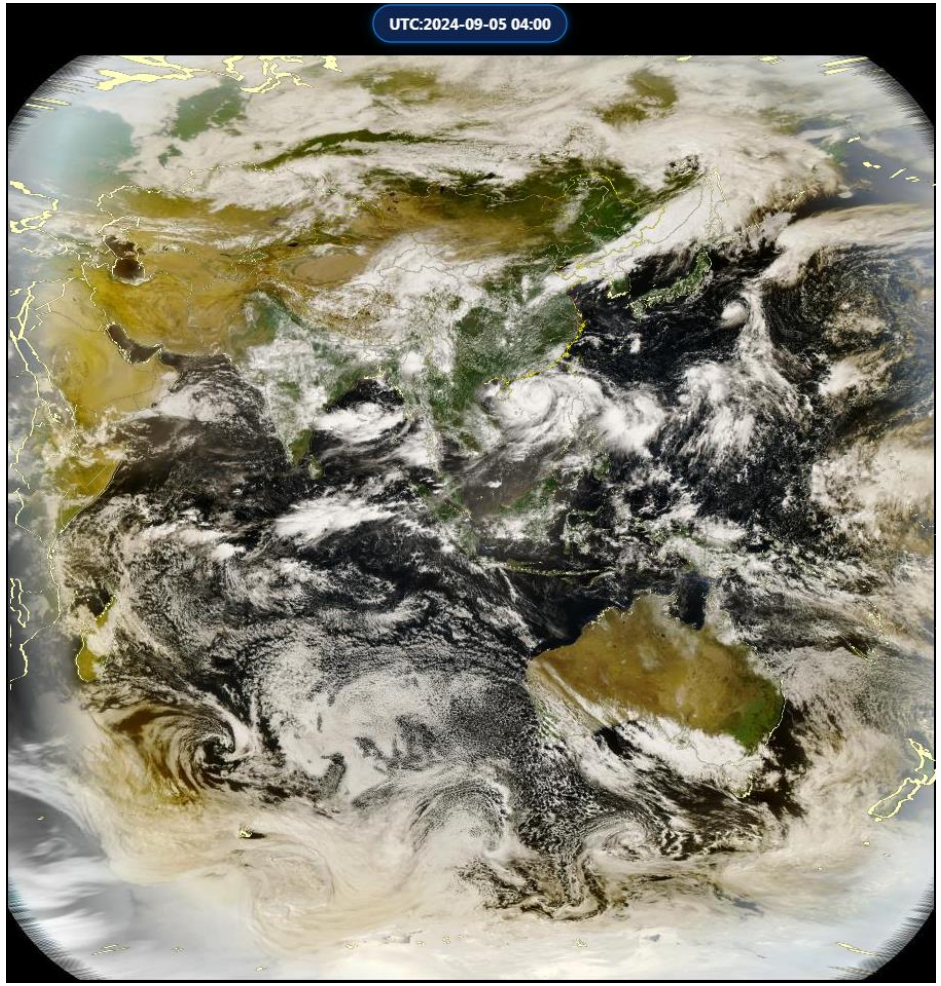


Platforms：SWAP

Dynamic switching of multiple projection modes



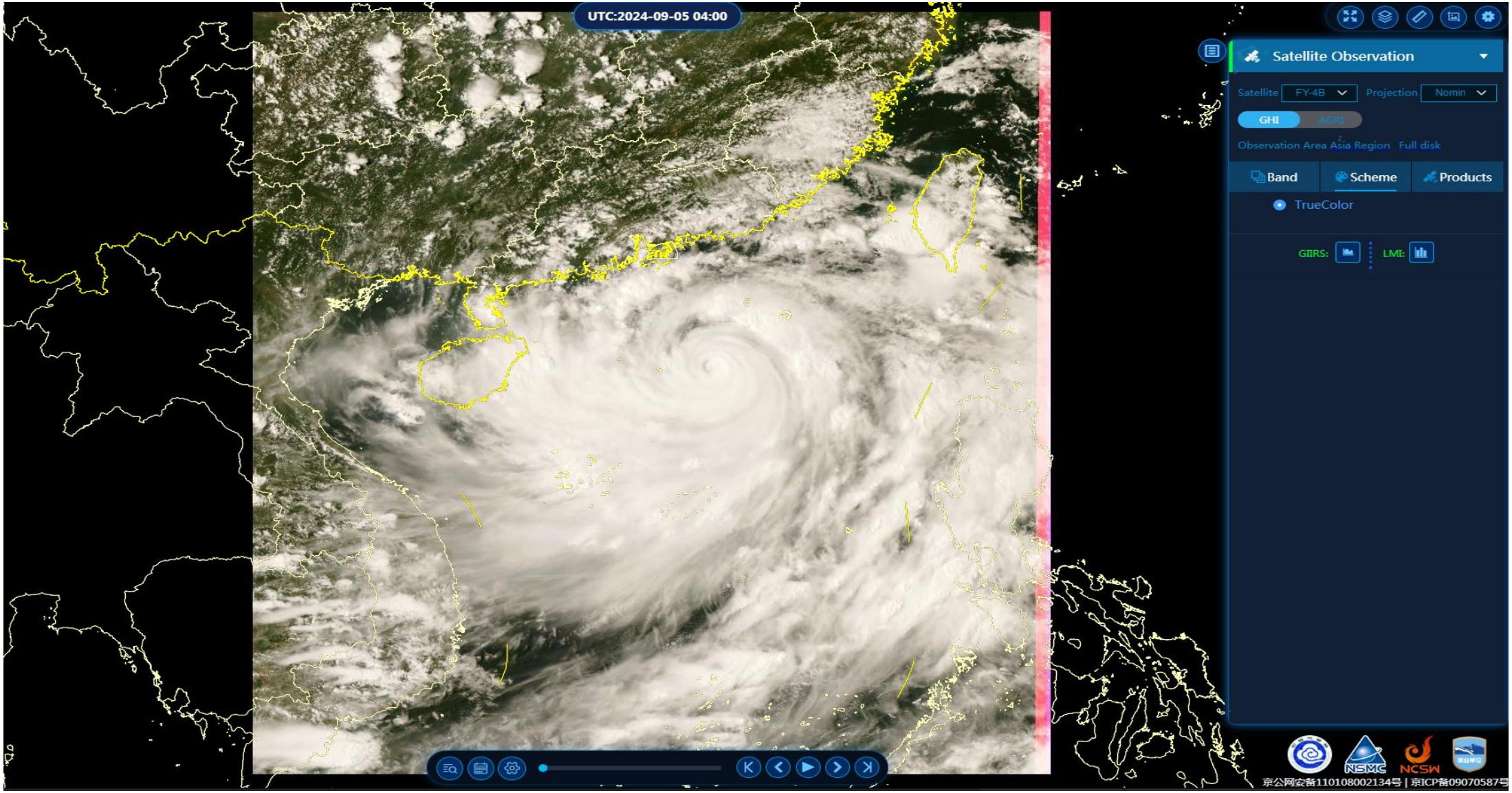




Nominal projection

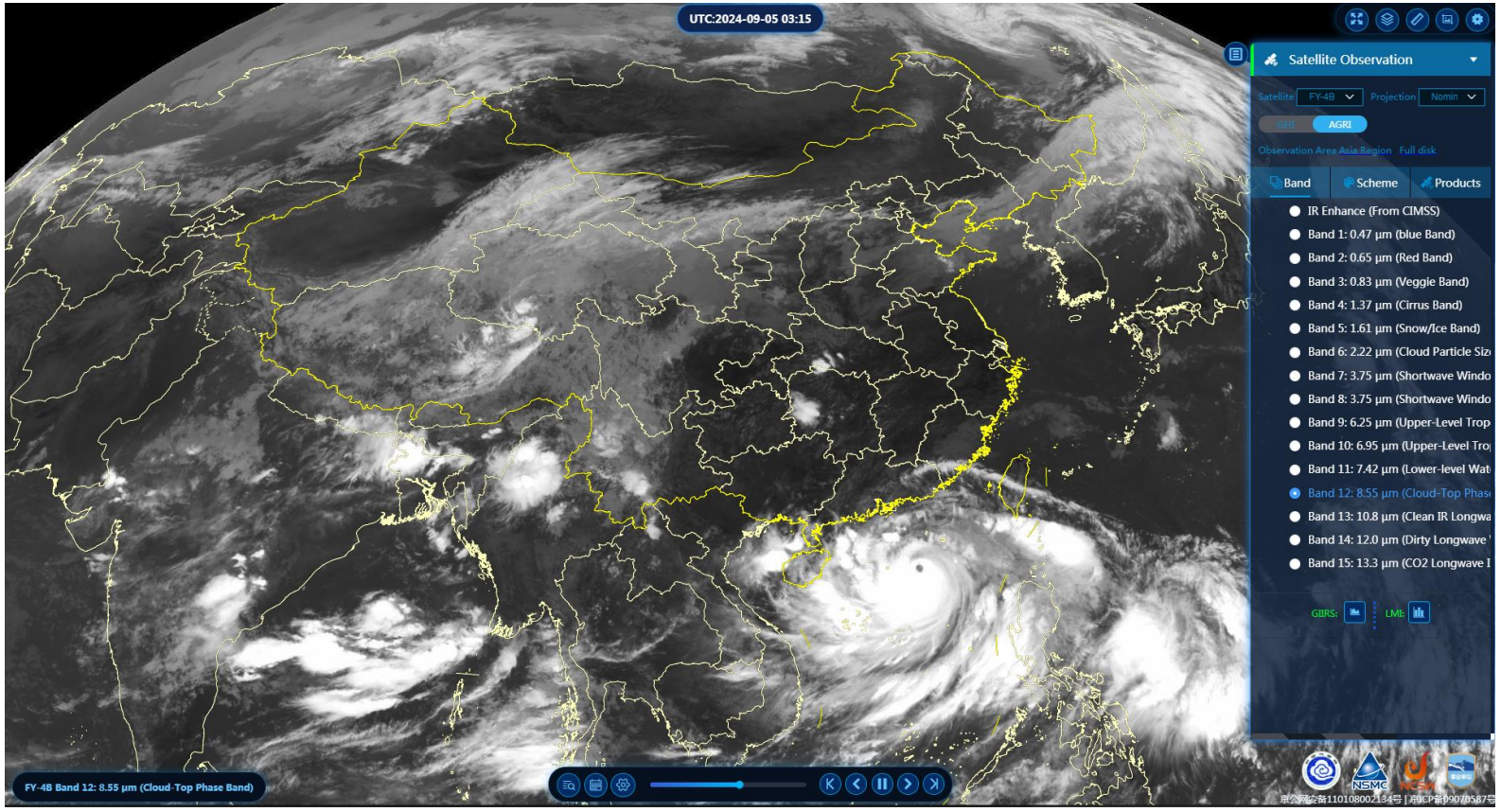
Equal latitude and longitude projection

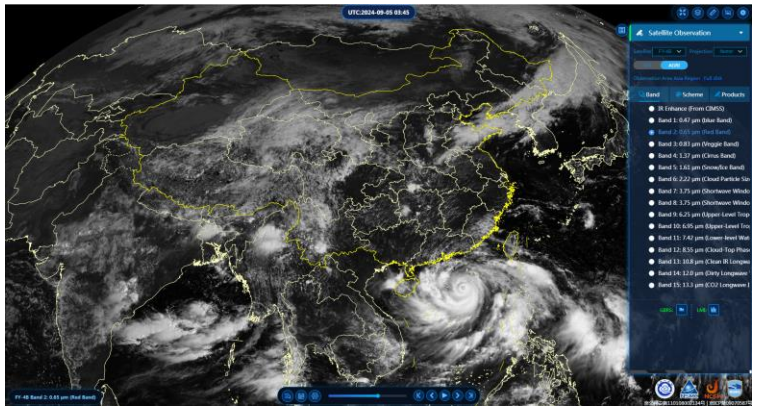
Platforms： SWAP

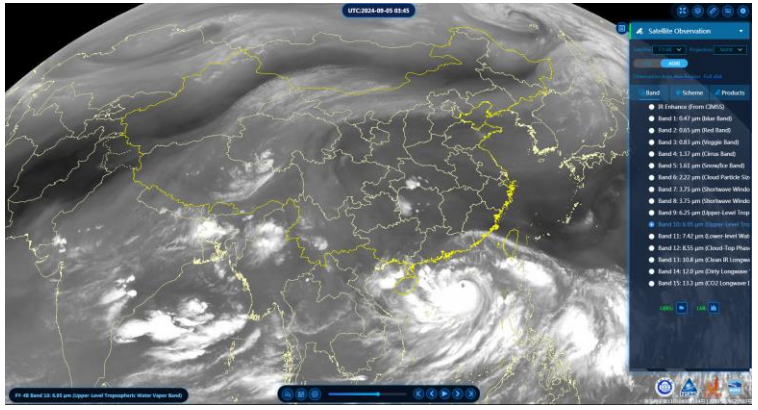


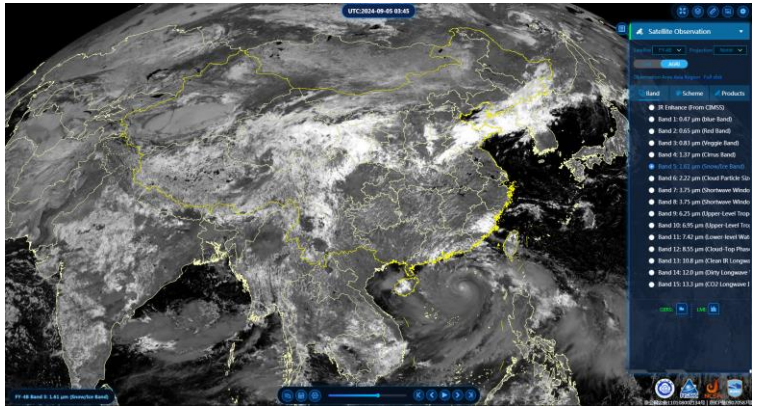
Platforms： SWAP

Feature： Satellite Channel View



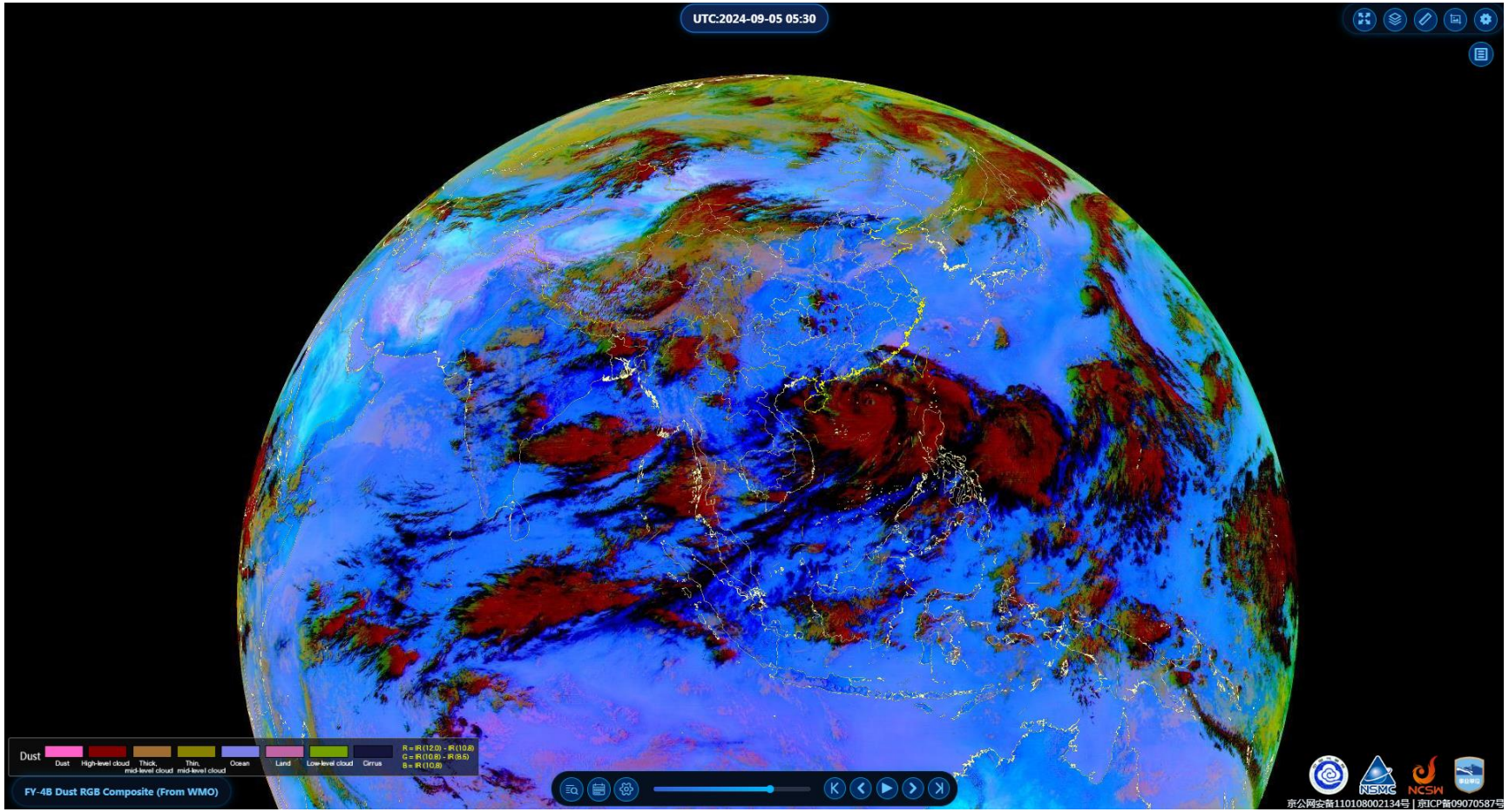






Platforms： SWAP

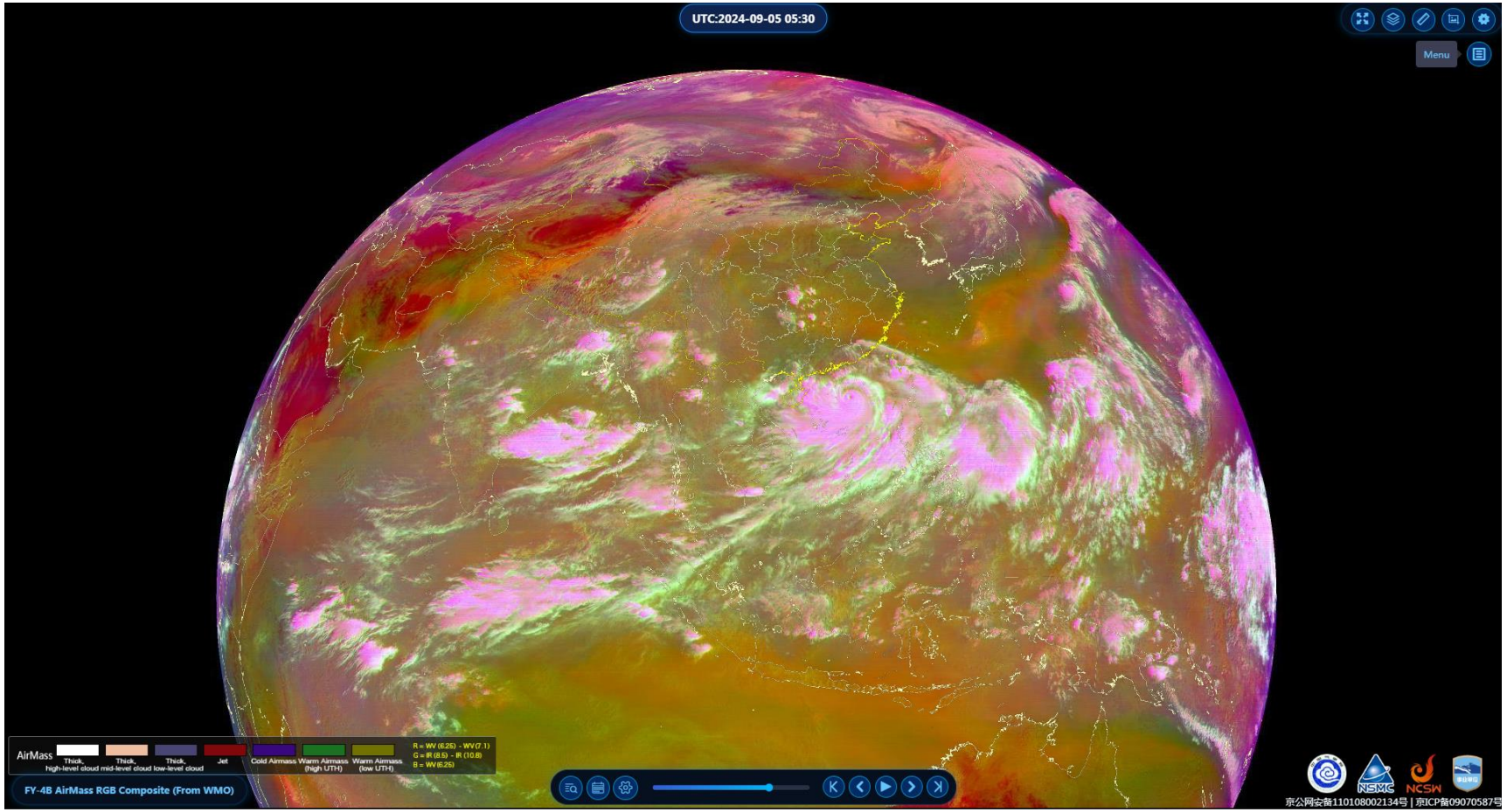
Feature： Synthetics Scheme



SWAP Support 12 Synthetics scheme
True Color
Natural Color RGB Composite
Dust RGB Composite From WMO
AirMass RGB Composite
Fog/Snow Composite
Clouds Convection RGB Composite
Volcanic Ash RGB Composite
Severe Storms RGB Composite
Day Convective Storms RGB Composite
Day Microphysics RGB Composite
Night Microphysics RGB Composite
Dust RGB From CMA

Platforms： SWAP

Feature： Synthetics Scheme



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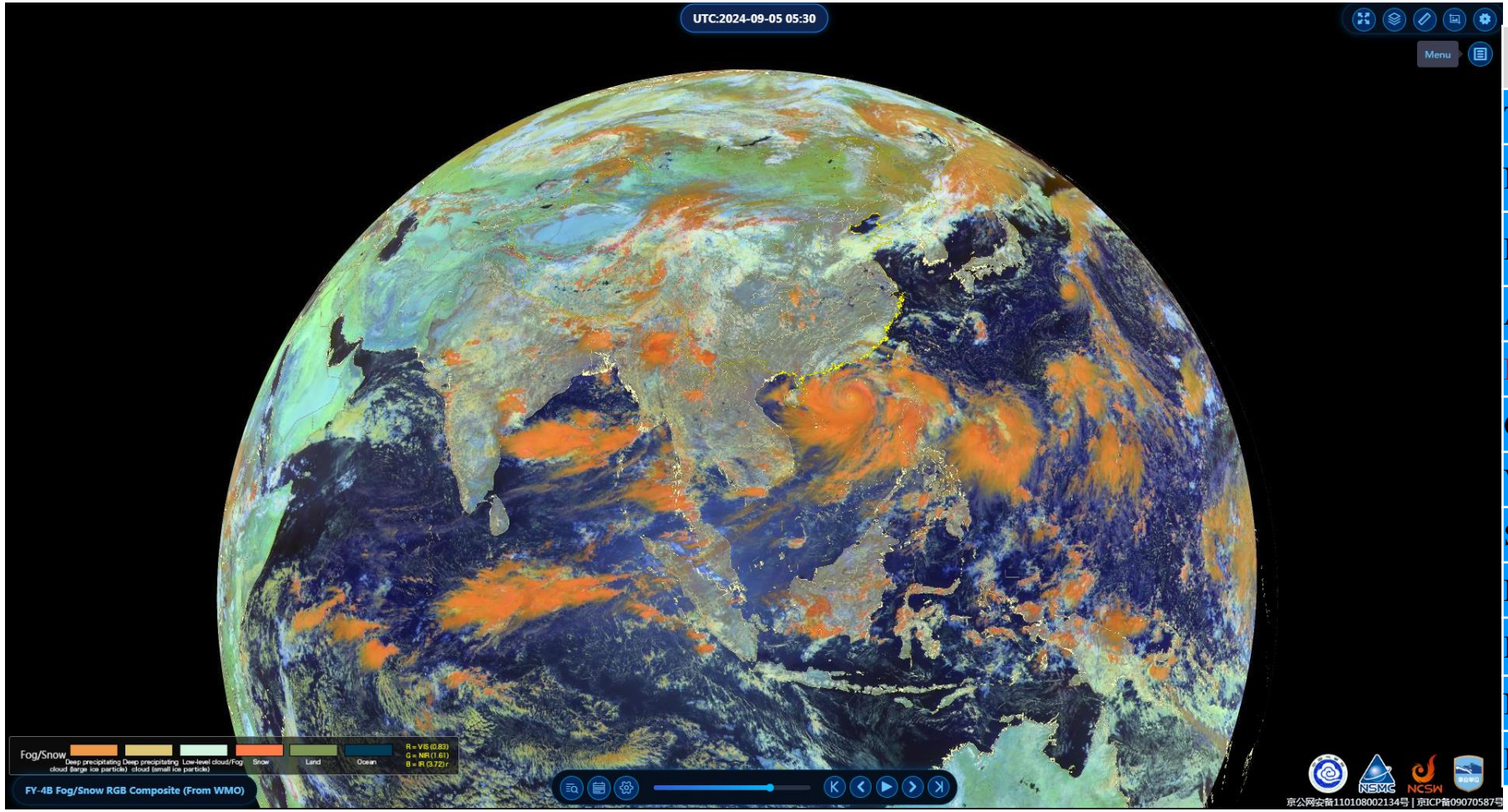
Platforms： SWAP

Feature： Synthetics Scheme



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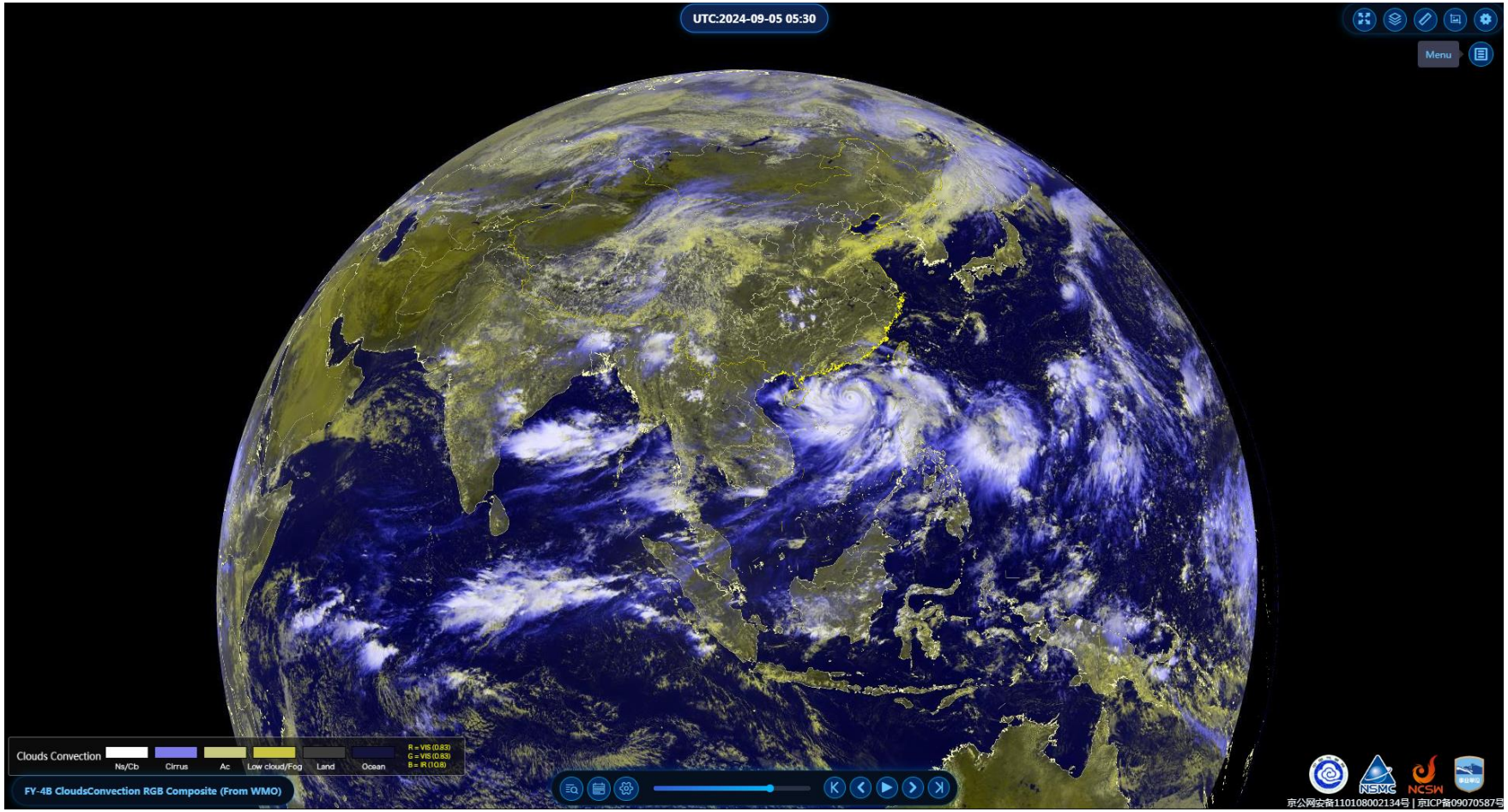

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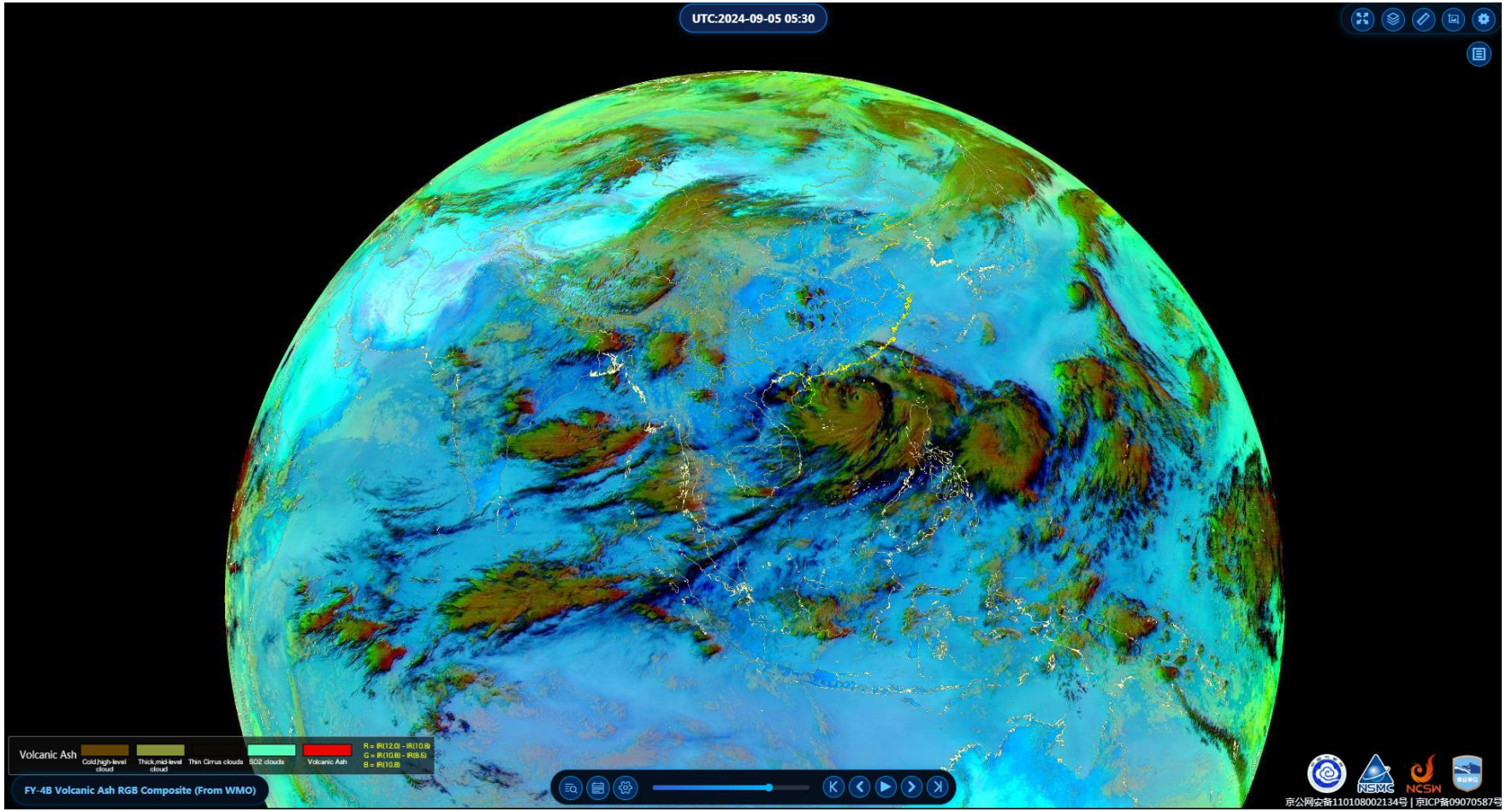
Dust RGB From CMA

Platforms： SWAP

Feature： Synthetics Scheme



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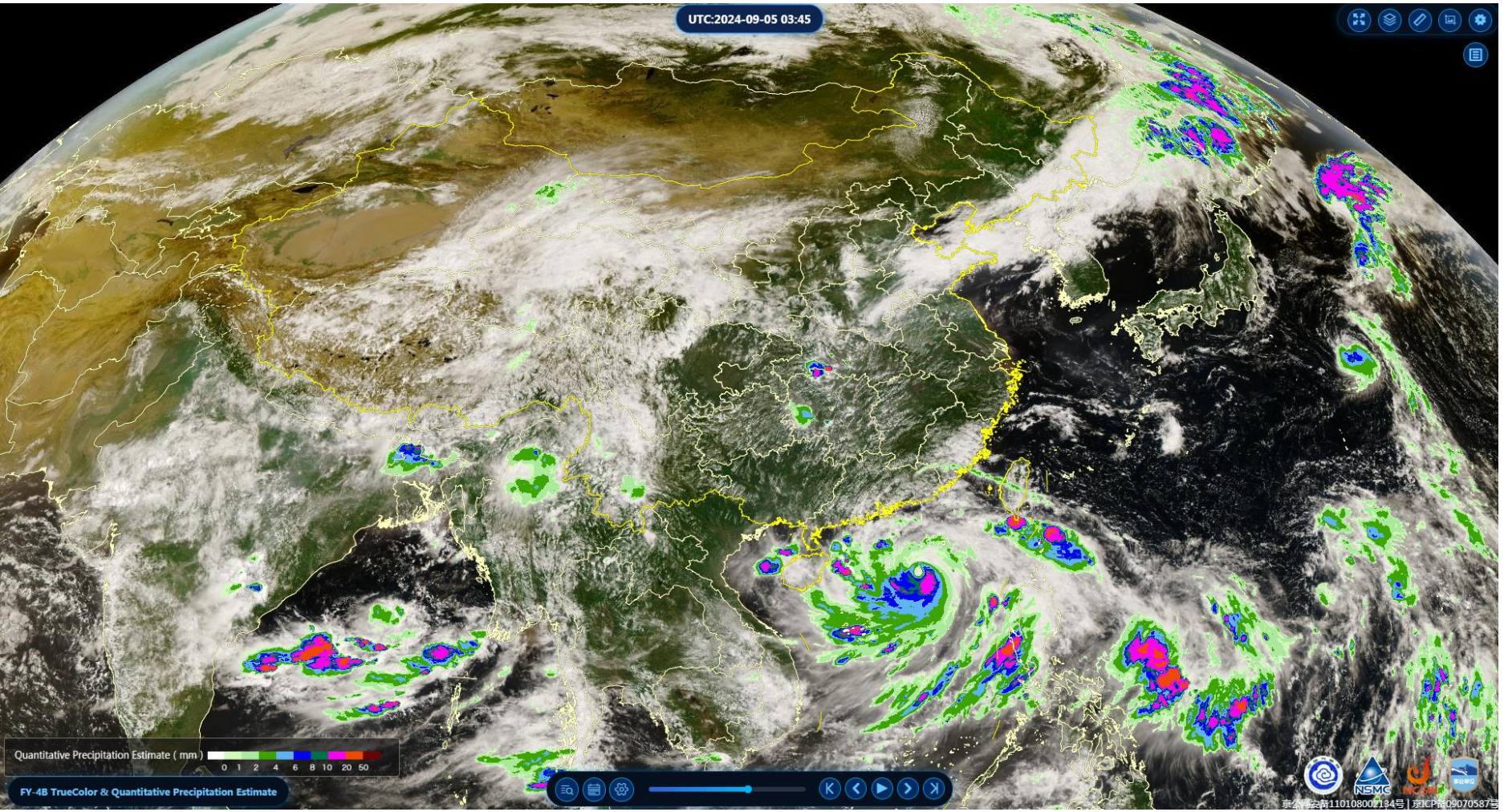
Day Microphysics RGB Composite
Night Microphysics RGB Composite
Dust RGB From CMA

Platforms： SWAP

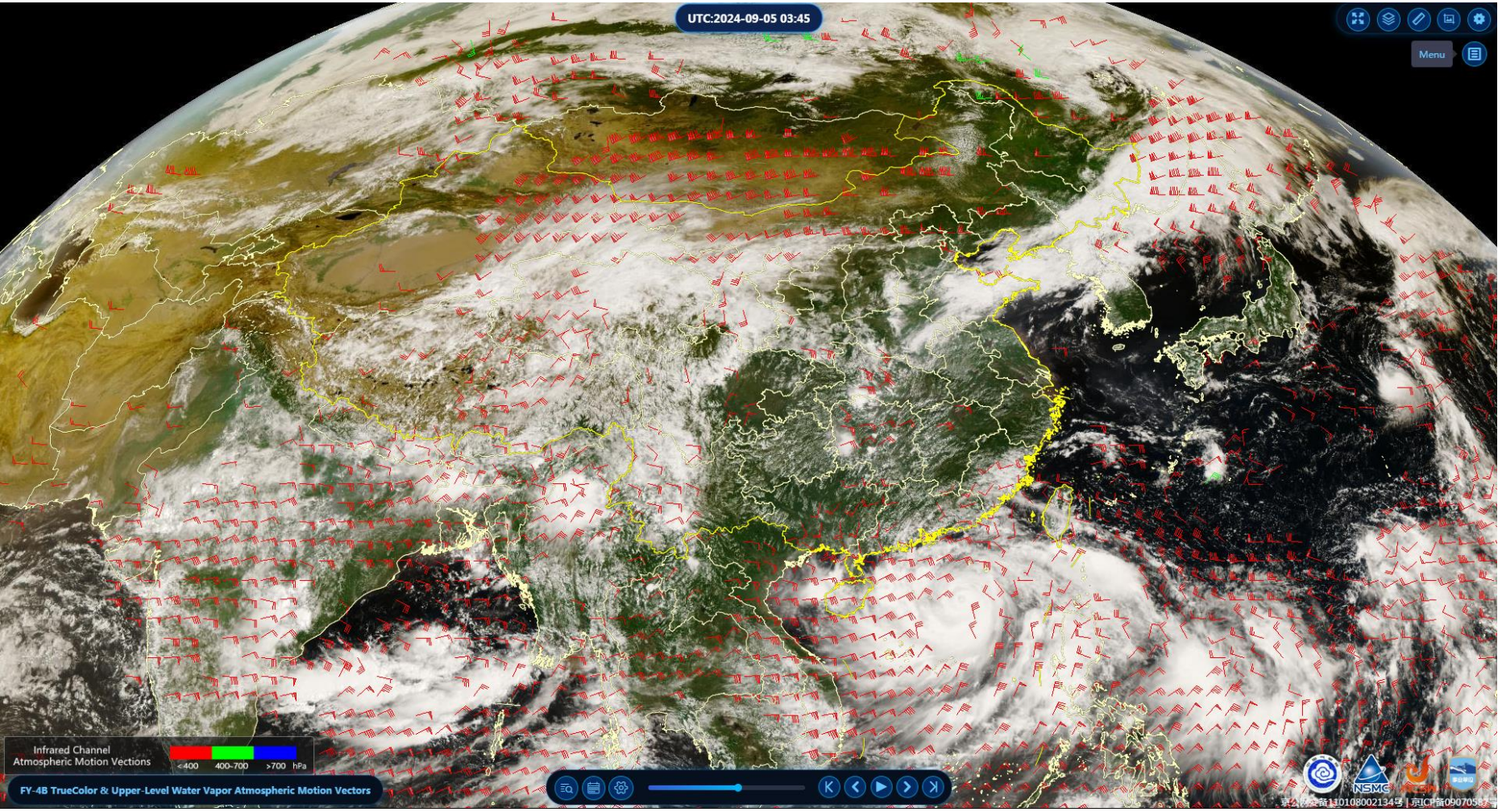
Feature： Satellite product overlay



SWAP Support 14 Products
Quantitative Precipitation Estimate
Upper-Level Water Vapor Atmospheric Motion Vectors
Lower-Level Water Vapor Atmospheric Motion Vectors
Infrared Atmospheric Motion Vectors
Cloud Mask
Cloud Phase
Cloud Type
Cloud Top Height
Cloud Top Temperature
Cloud Top Pressure
Temperature(500hPa)
Temperature(700hPa)
Temperature(850hPa)
Temperature(1000hPa)

Platforms： SWAP

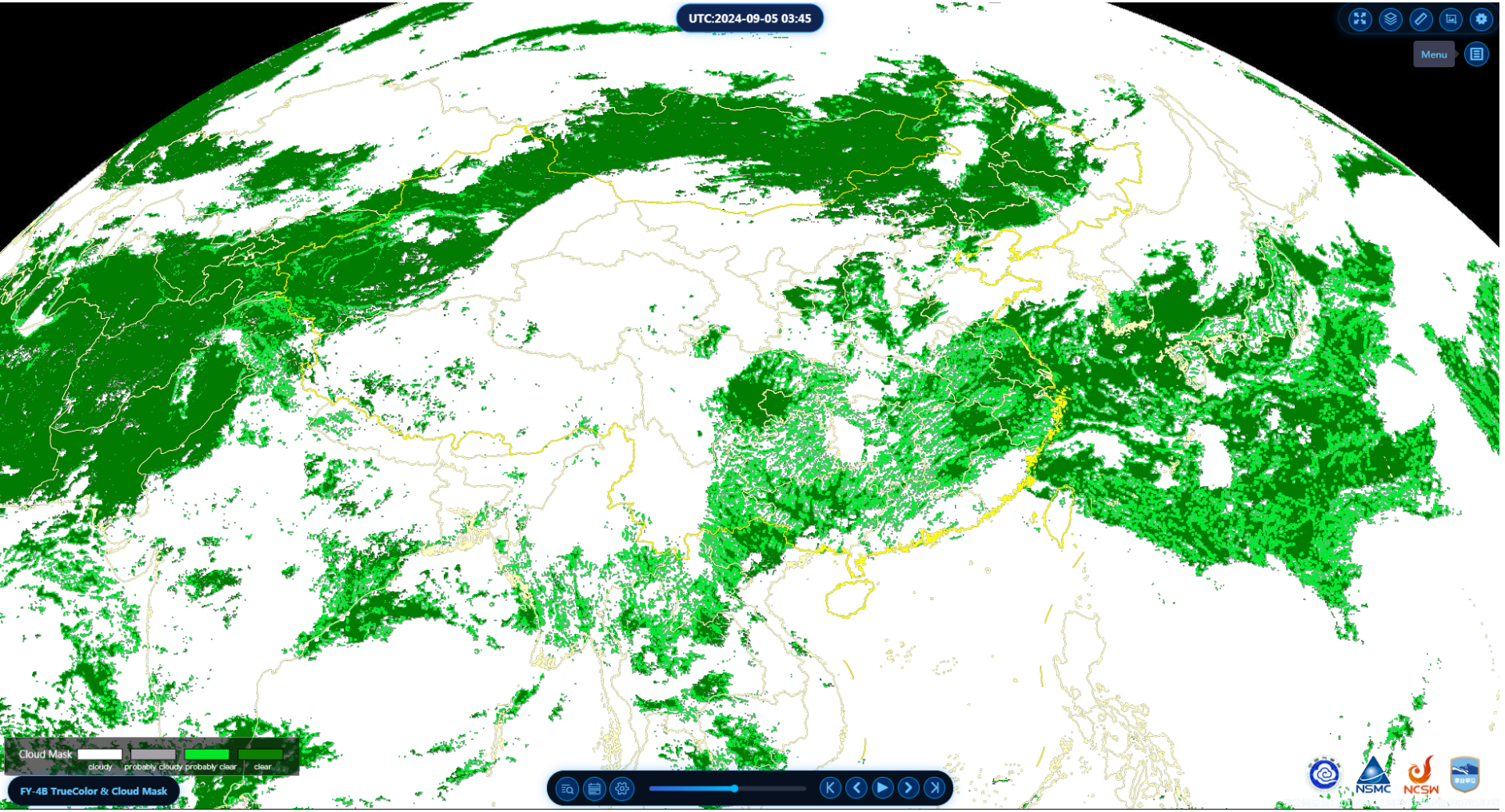
Feature： Satellite product overlay



SWAP Support 14 Products
Quantitative Precipitation Estimate
Upper-Level Water Vapor Atmospheric Motion Vectors
Lower-Level Water Vapor Atmospheric Motion Vectors
Infrared Atmospheric Motion Vectors
Cloud Mask
Cloud Phase
Cloud Type
Cloud Top Height
Cloud Top Temperature
Cloud Top Pressure
Temperature(500hPa)
Temperature(700hPa)
Temperature(850hPa)
Temperature(1000hPa)

Platforms： SWAP

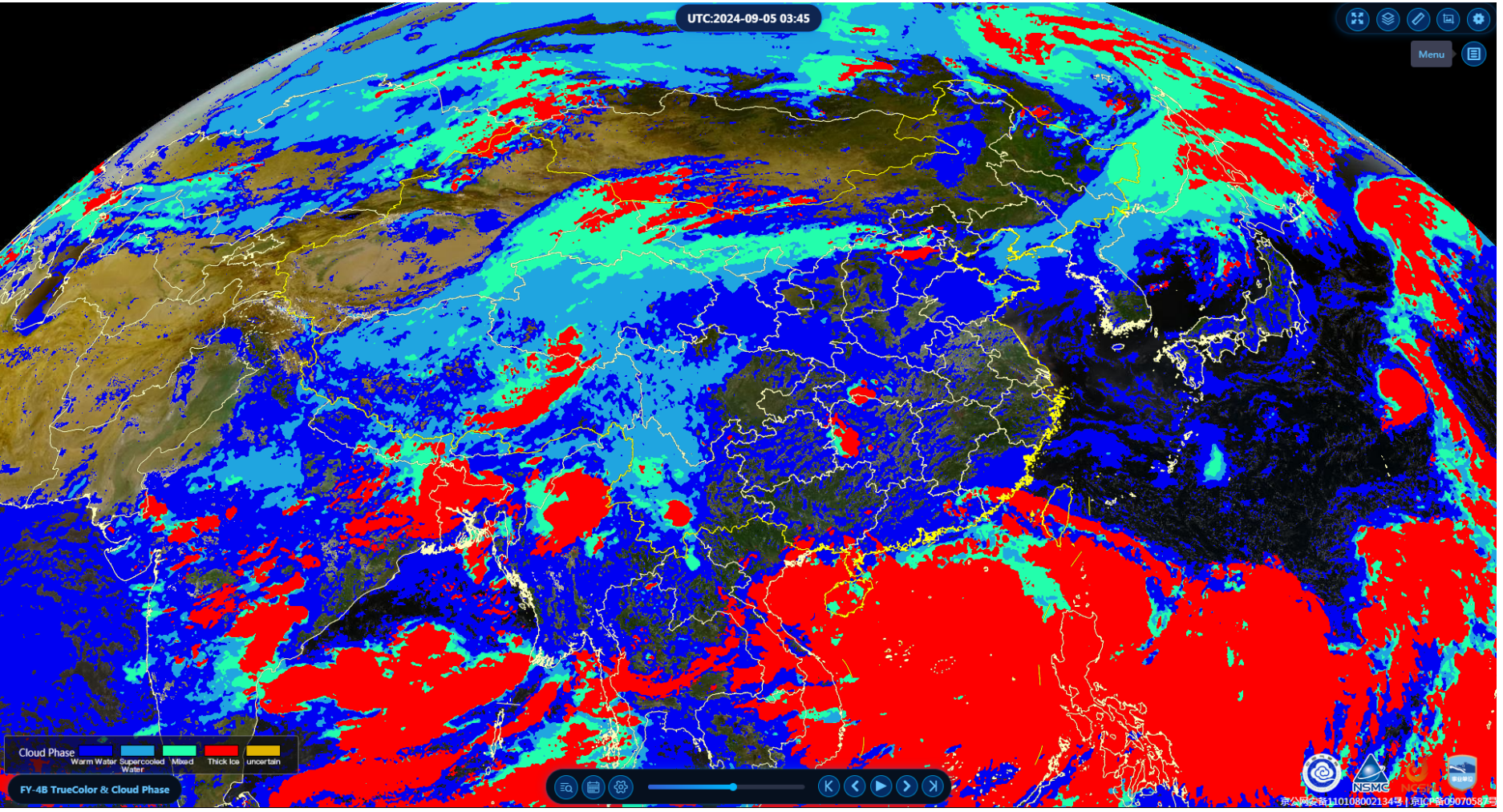
Feature： Satellite product overlay



SWAP Support 14 Products
Quantitative Precipitation Estimate
Upper-Level Water Vapor Atmospheric Motion Vectors
Lower-Level Water Vapor Atmospheric Motion Vectors
Infrared Atmospheric Motion Vectors
Cloud Mask
Cloud Phase
Cloud Type
Cloud Top Height
Cloud Top Temperature
Cloud Top Pressure
Temperature(500hPa)
Temperature(700hPa)
Temperature(850hPa)
Temperature(1000hPa)

Platforms： SWAP

Feature： Satellite product overlay



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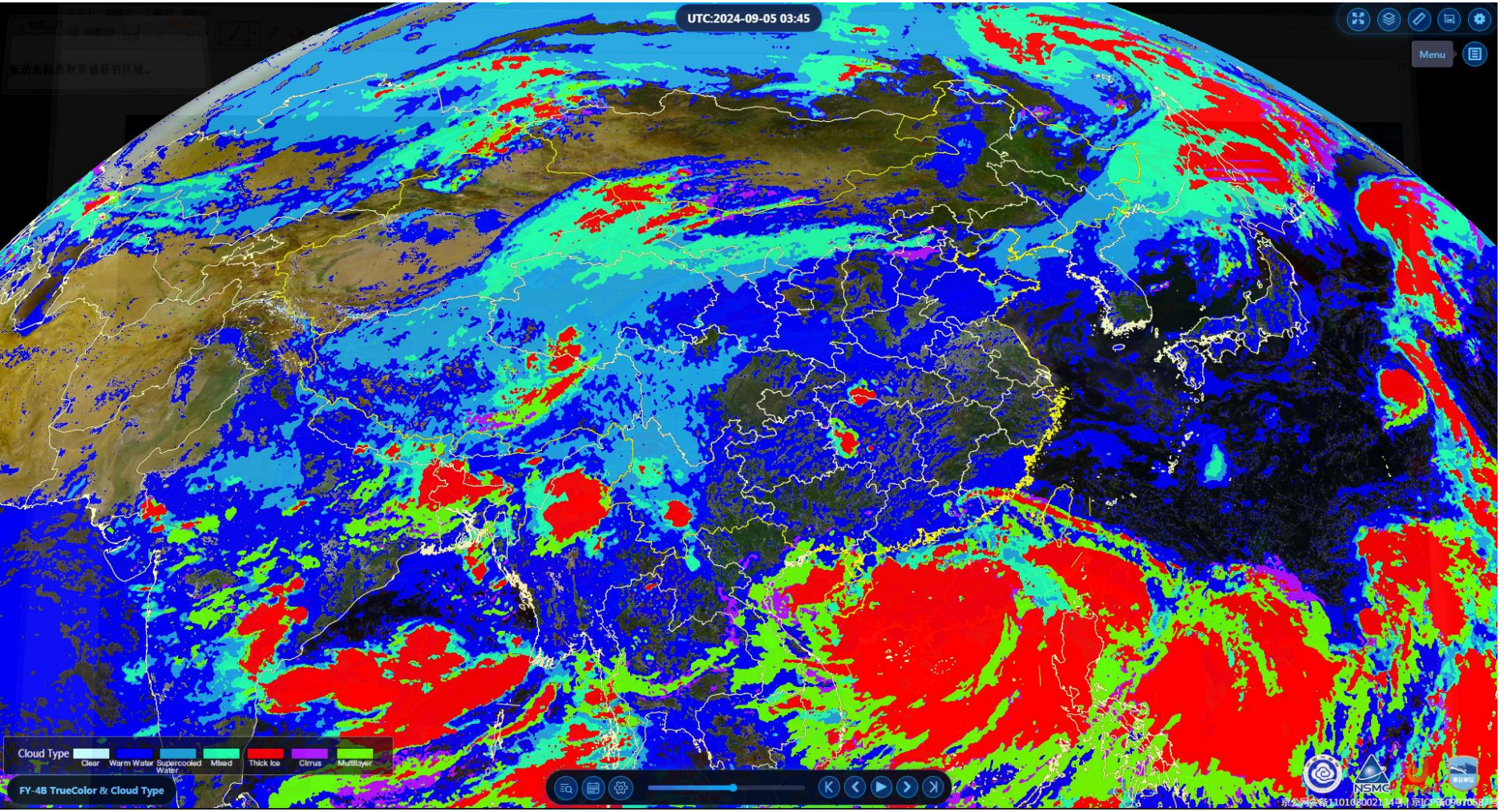

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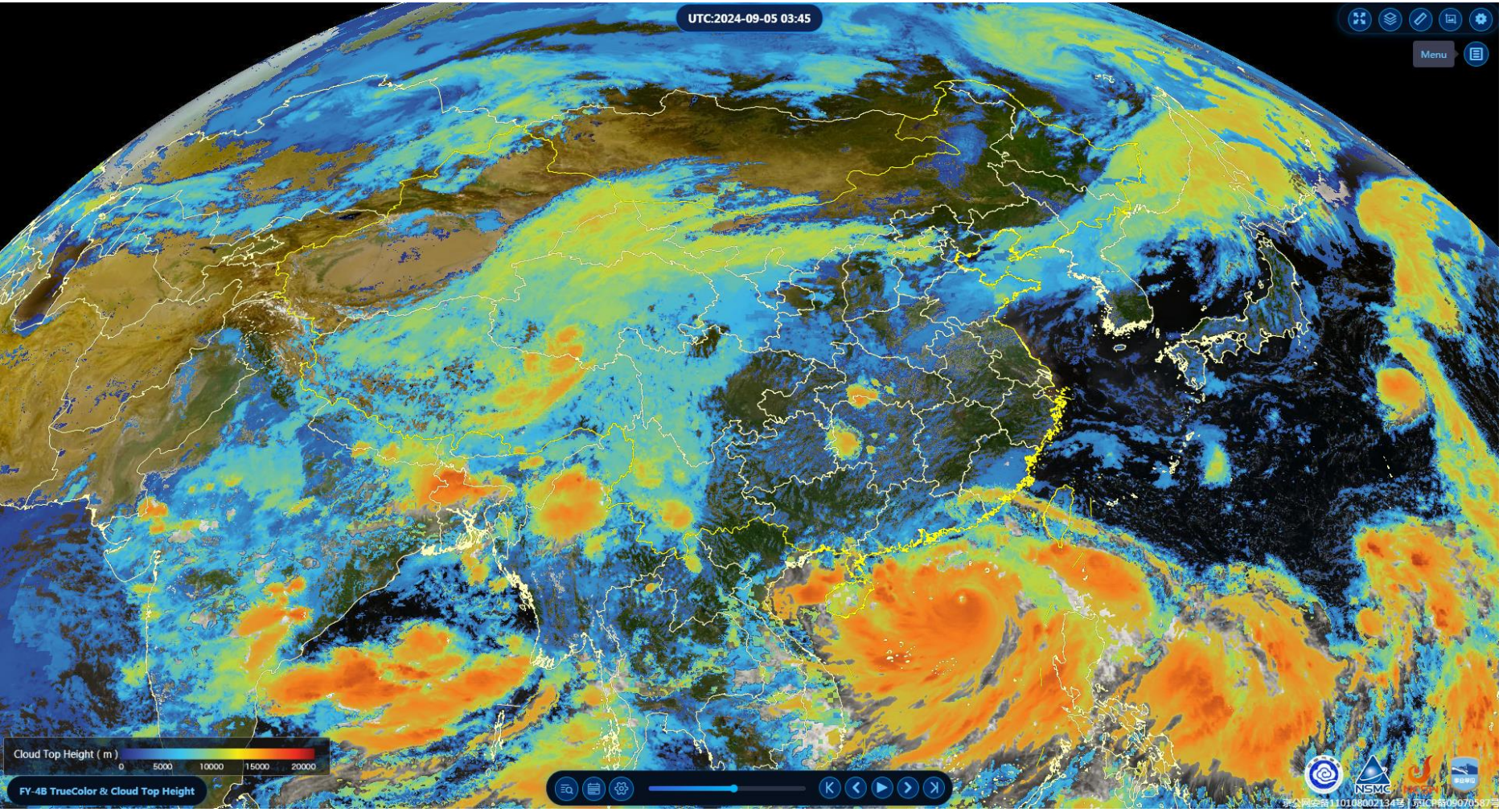

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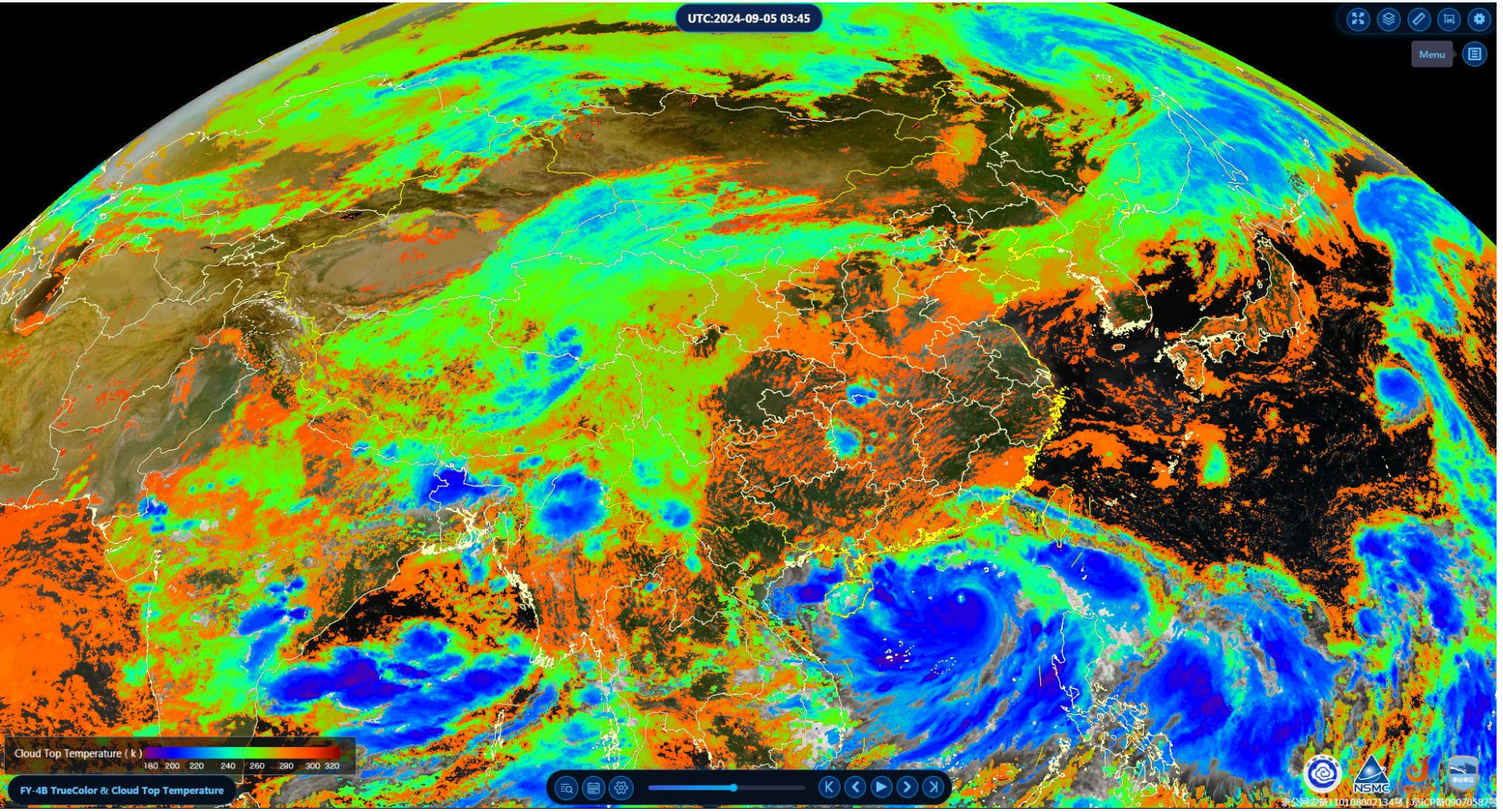
Platforms： SWAP

Feature： Satellite product overlay



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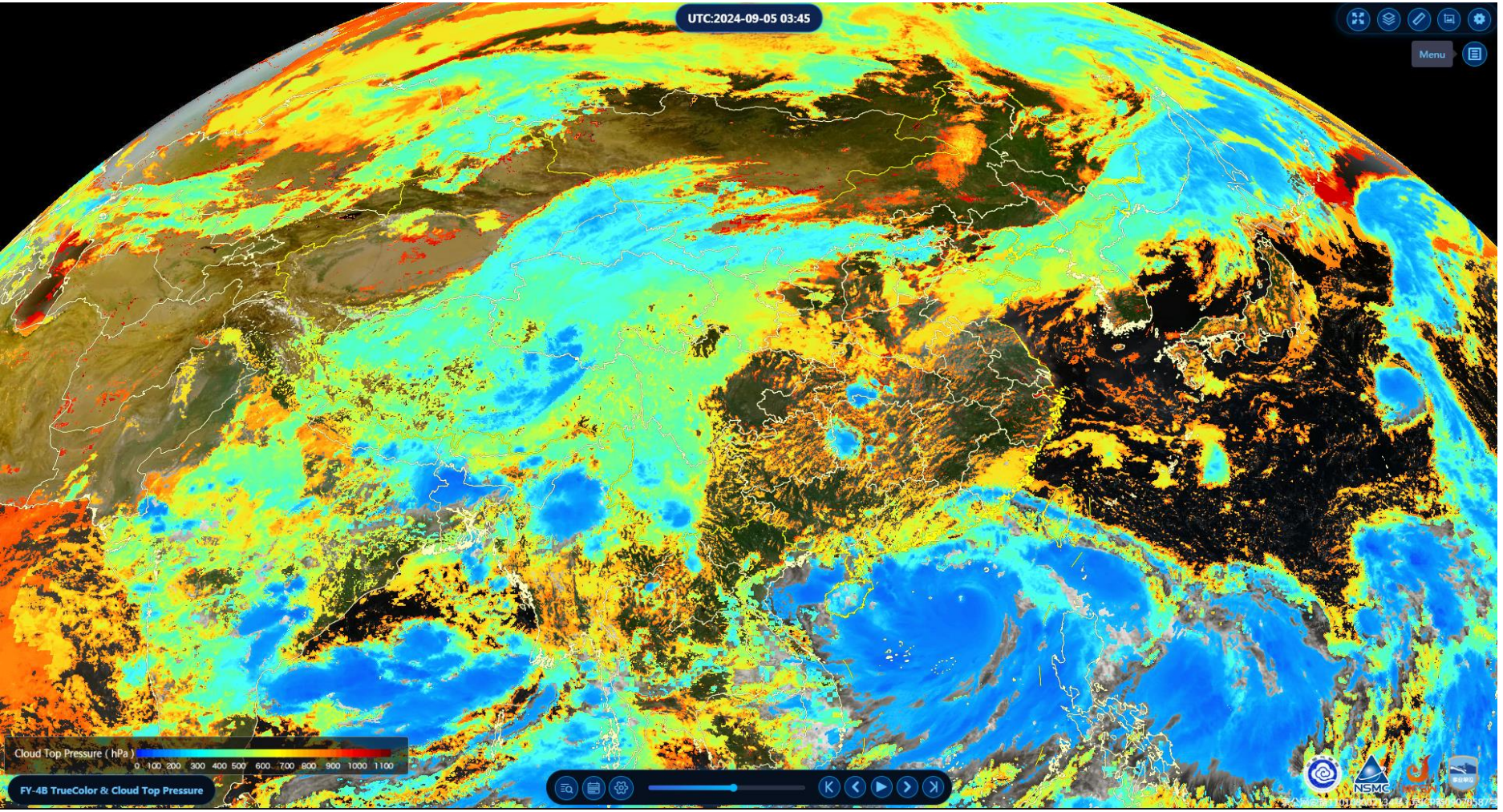
Temperature(850hPa)
Temperature(1000hPa)

Platforms： SWAP

Feature： Satellite product overlay



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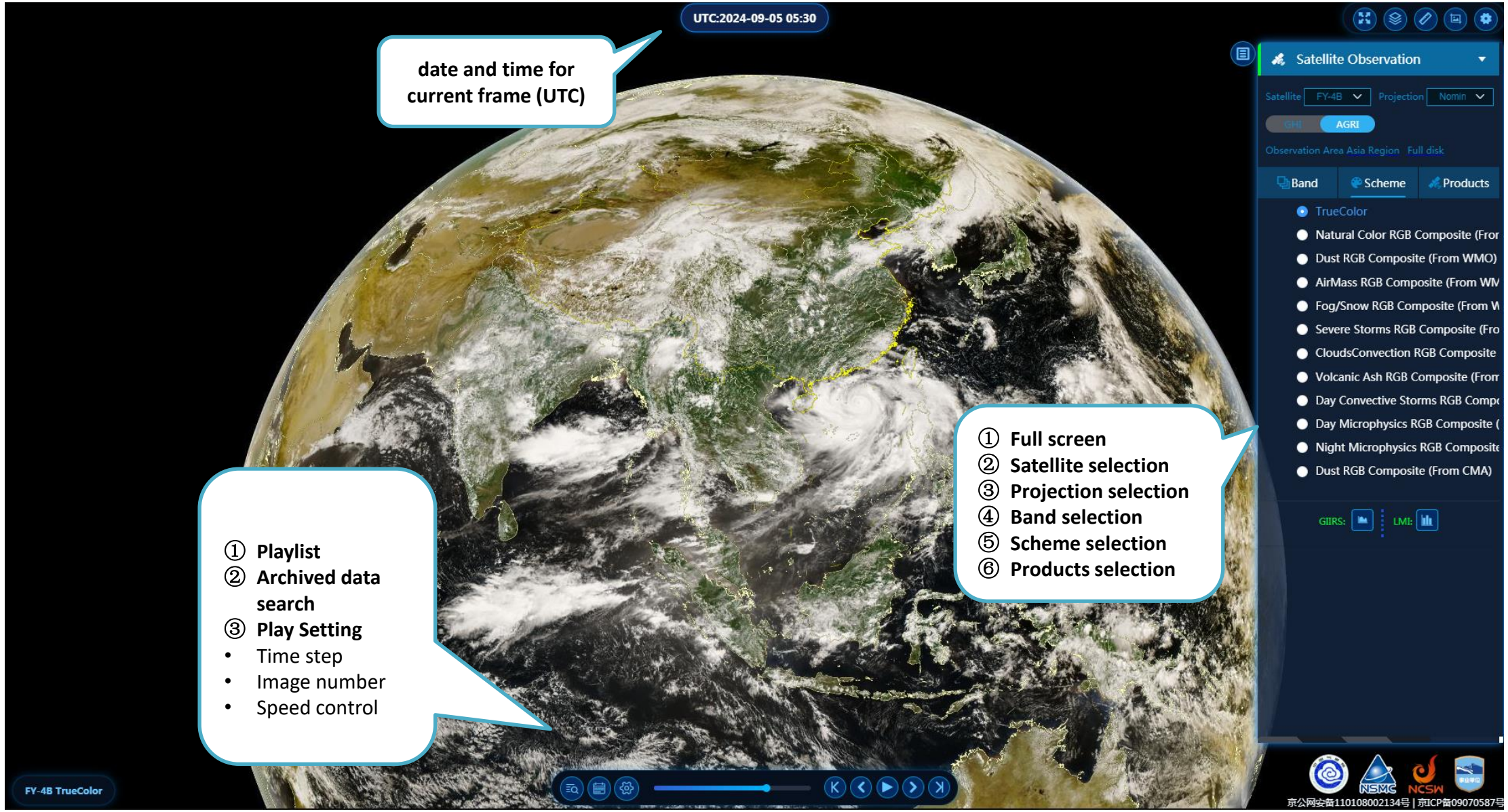
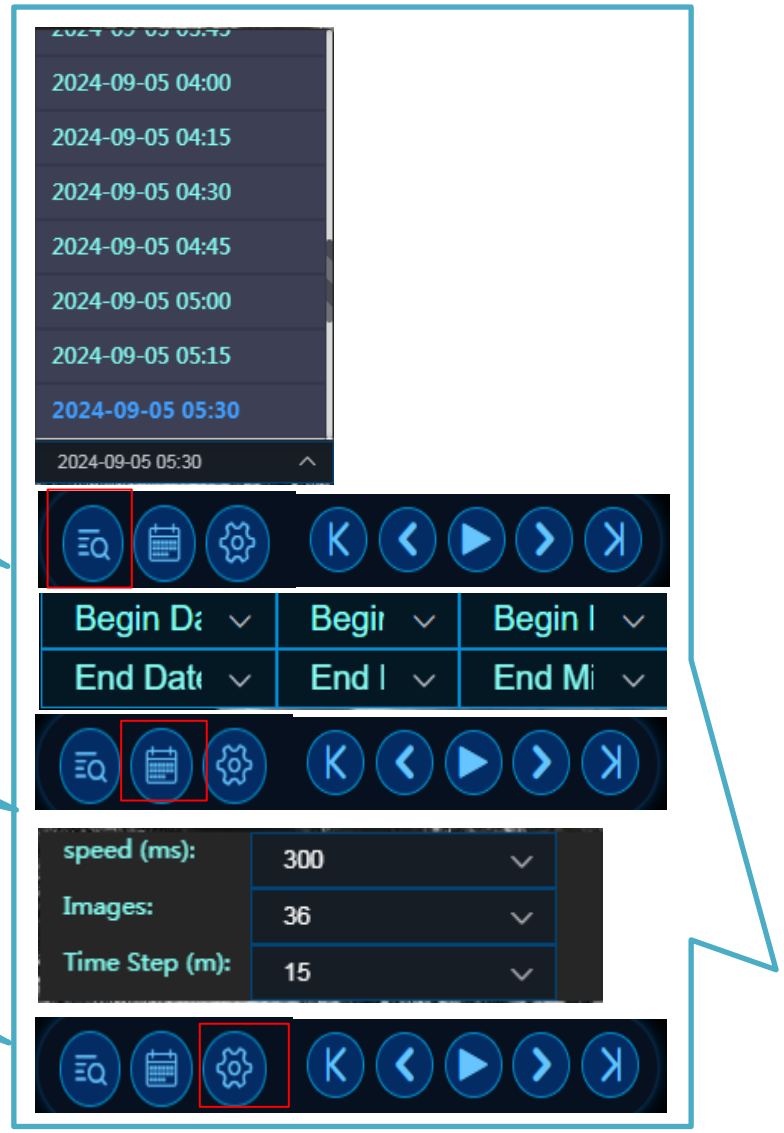
Platforms: SWAP



Platforms：SWAP

Feature： Archiving images

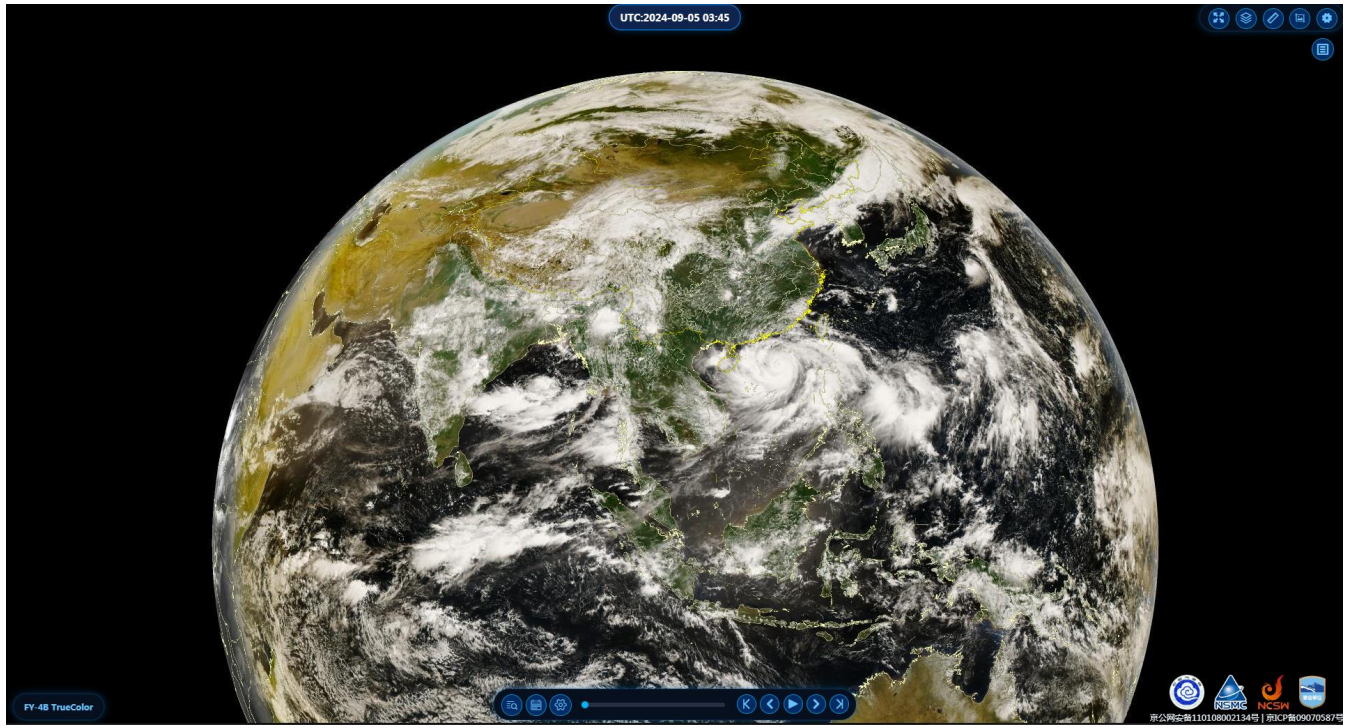


Play list

Archived data query

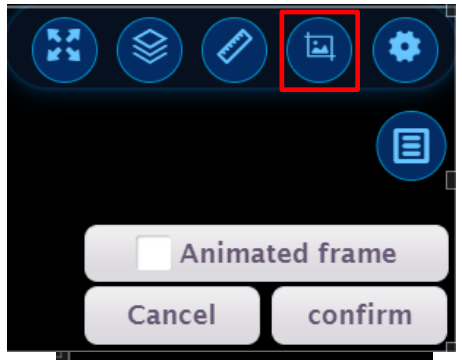
Setting Control

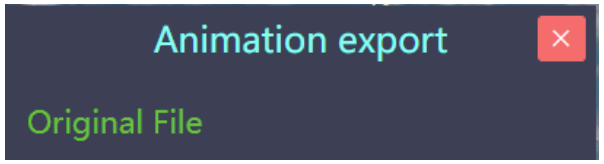
The “Archived Image” can be freely selected for FY4 data within the last 1 year, and the business personnel can perform historical weather process animation playback as needed.

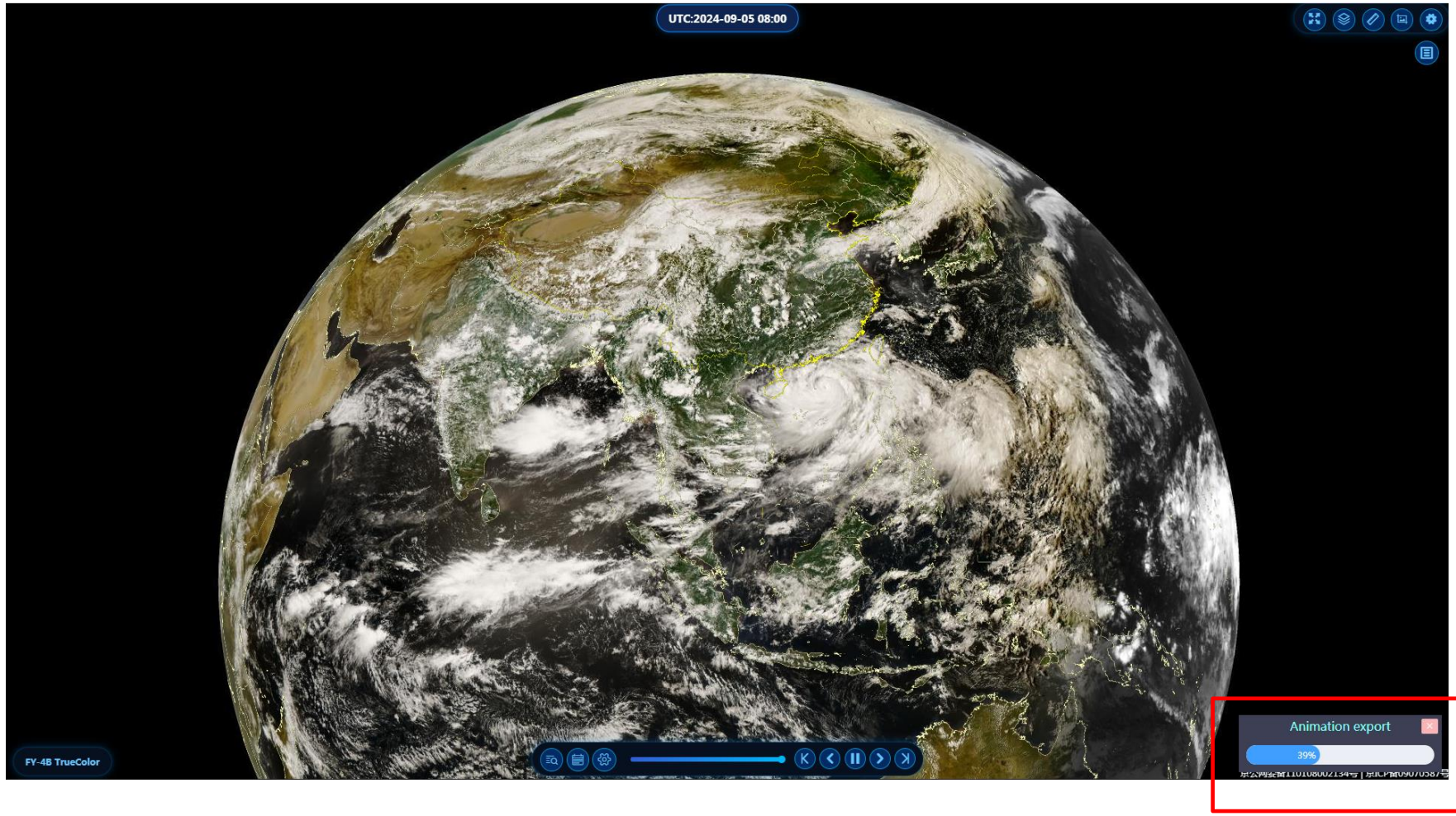


Platforms： SWAP

Feature : Animation export



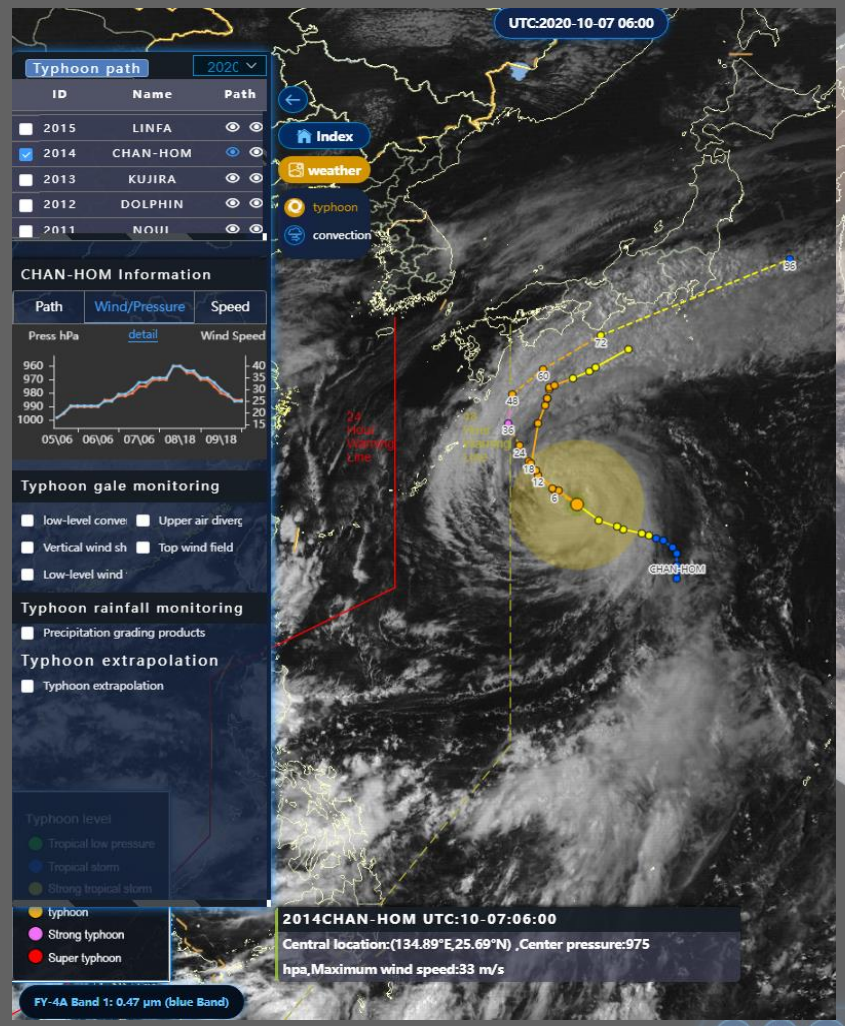




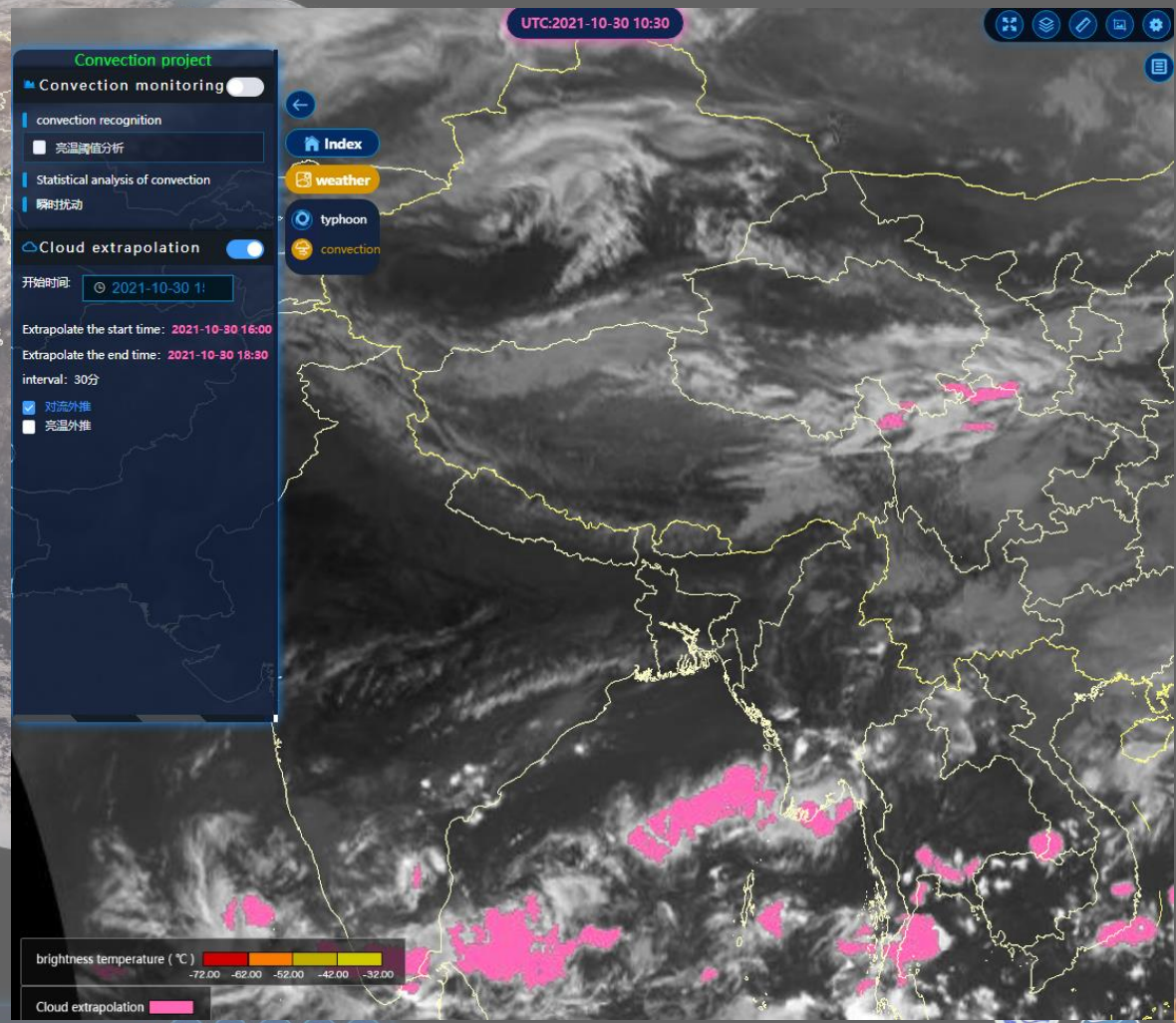
Platforms： SWAP

weather
typhoon
convection

Typhoon analysis



Convective analysis and forecast



FY-4A True Color

Outline

Platforms

- SWAP stand-alone version
- SWAP web version

Application

- FengYun EARTH
- FY_ESM
- Data Sharing
- User Conference

FengYun Earth Platform Facilitates User-targeted International Service

Web-based Platform | Comprehensive Cloud Platform

Main User: Forecaster

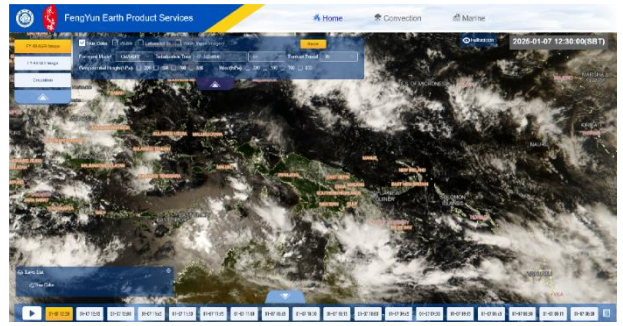
Typical Applications: Weather Monitoring and Analyzing

Realize multi-source, multi-scale, multi-element, multi-form data access;

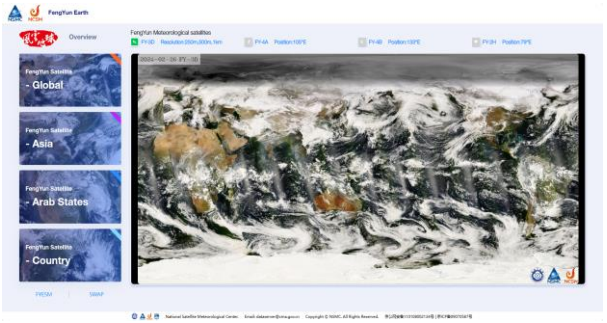
Offer over 100 quantitative products across 5 categories, including satellite images, meteorological elements, disaster events, climate, and model verification.

More than 90 countries accessed FengYun Earth platform.

Website：http://fyearth.nsmc.org.cn/

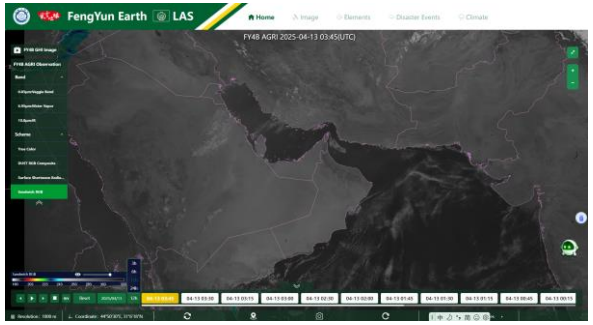


FengYun Earth supported the Solomon Islands in hosting the Pacific Games



Global version

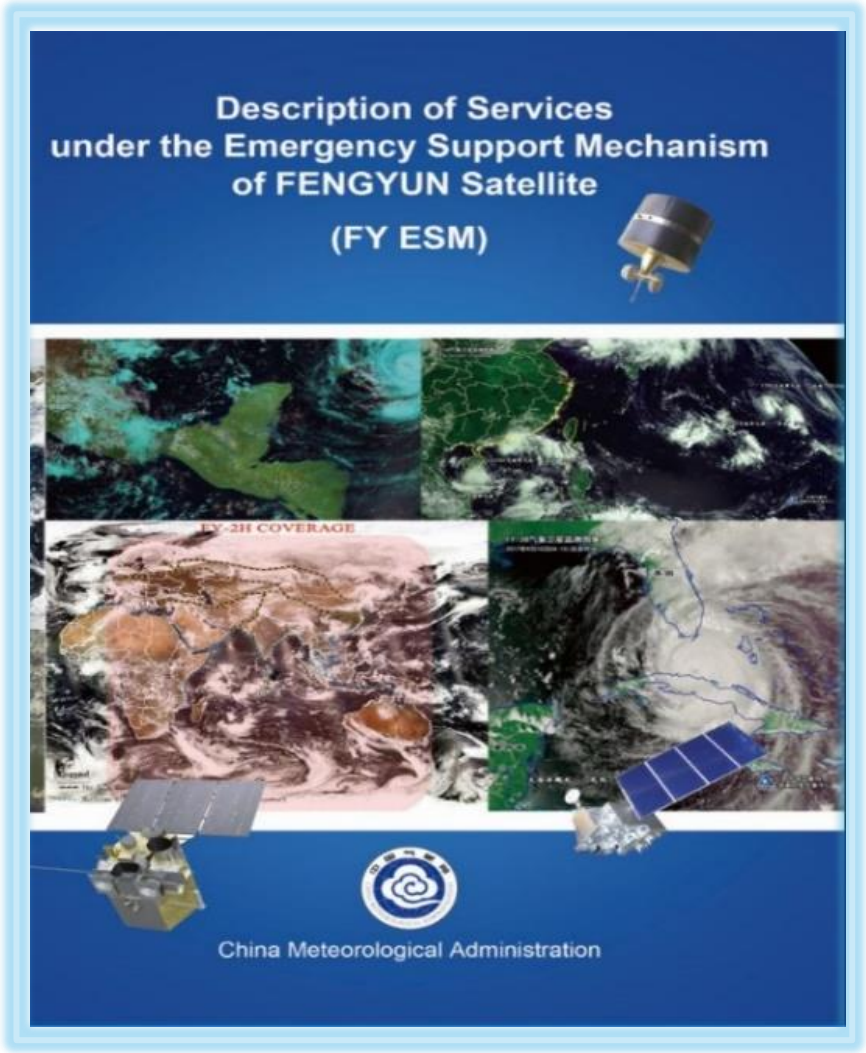
ASEAN version



Arabic Version

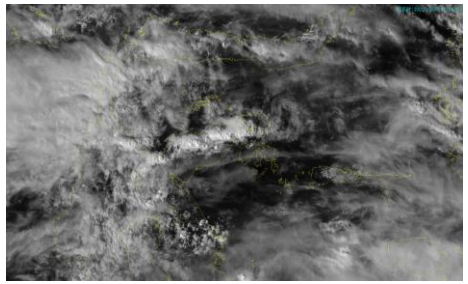
Sri Lanka Version

Emergency Support Mechanism for International Users of FengYun Satellites（FY-ESM）

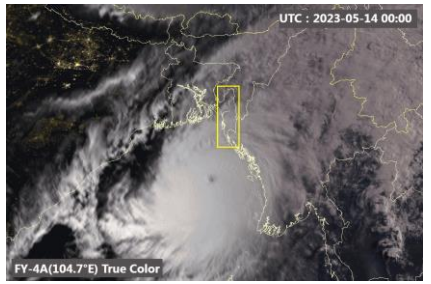


http://data.nsmc.org.cn/FYESM/en/emergency/index.html

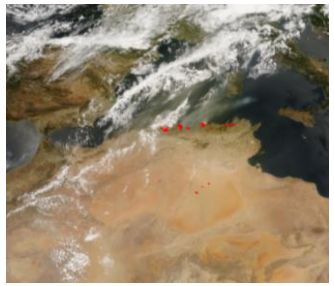
- China Meteorological Administration (CMA) established the Emergency Support Mechanism of FENGYUN Satellite (FY_ESM) for international users on April, 2018.
- Once FY_ESM is activated, highly frequent observation of a given area at an interval of up to 1 minutes will be provided to users.
- So far, 37 countries have registered FY_ESM.
- Since 2018, more than 170 emergency support services have been provided to 85 countries worldwide through the FY-ESM and CHARTER mechanisms.



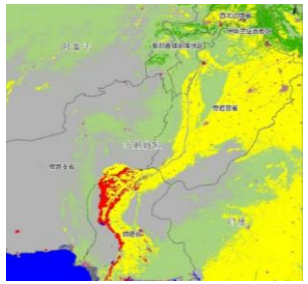
Convection in Indonesia



Tropical Cyclone in Myanmar



Fire in Tunisia

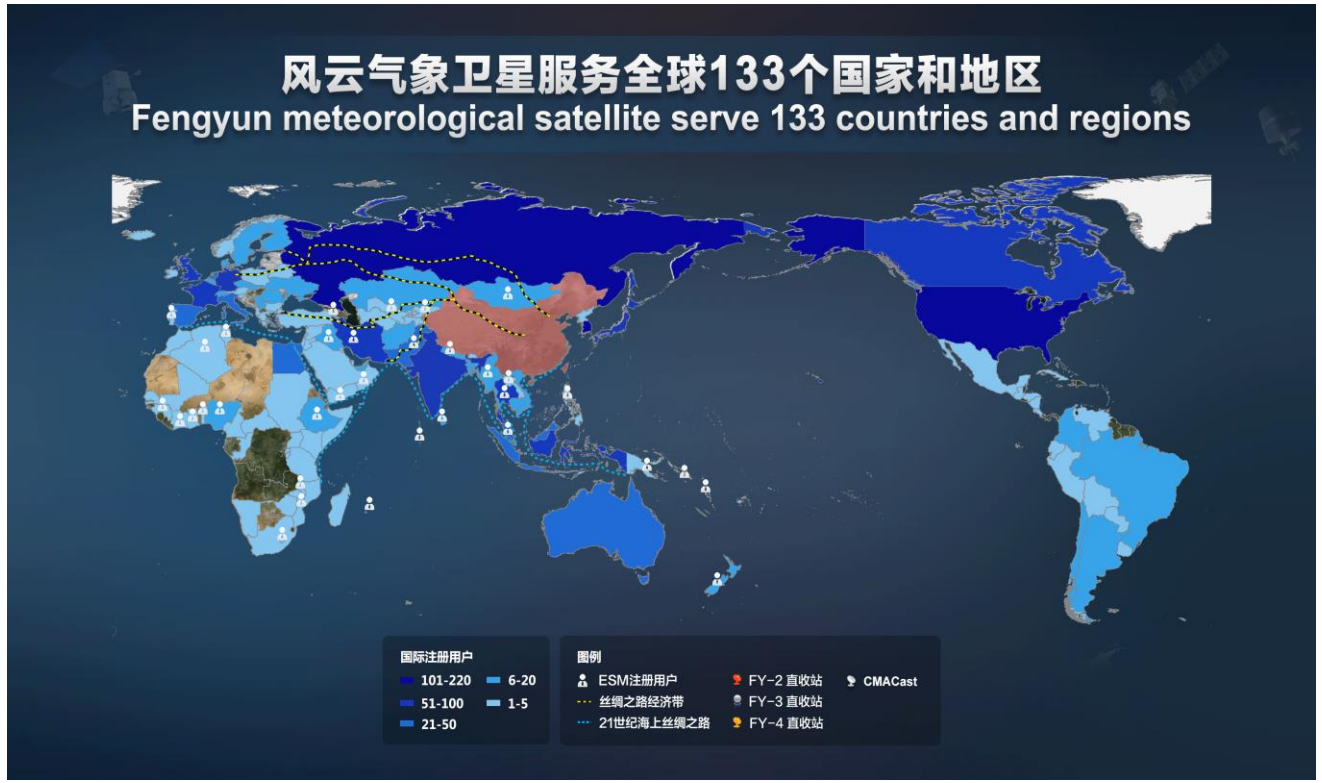


Flood in Pakistan

Data Services

http://satellite.nsmc.org.cn/DataPortal/en/home/index.html

How to get an account: Please send an E-Mail to: iusc_nsmc@cma.gov.cn



Main data services

- For Common Users
  - Data service website
  - Data download toolkit
- For Real-time Users
  - Direct broadcasting system
  - CMACast
  - FY-3 software packages
  - WIS/GTS
- For Emergency Users
  - Emergency Support Mechanism of FENGYUN Satellite (FY_ESM)

- **133 countries and regions used FengYun meteorological satellite data.**
- **From 2017 to 2024, the overall satisfaction of international remote sensing services was 82%.**

FengYun International User Conference

website：http://www.nsmc.org.cn/conference/fysuc/2025/

The purpose of the conference is to establish a platform for international users of FengYun satellites, facilitating in-depth discussions regarding their applications and requirements, promoting the global integrated application of FengYun satellites to achieve maximum benefits across various application areas, and mitigating the impacts of hazardous weather, water, or climate events.

成功举办了3次风云卫星国际用户大会

Three Successful FengYun International User Conference Have been held

Thank you for your attention !

Email:
jiax@cma.gov.cn