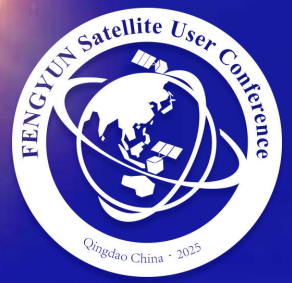


AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE

THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

Remote Sensing Inversion from Fengyun Meteorological Satellites Supports Low-Altitude Economy and Internationalized Technological Applications

Dr. Jianjun Chen, Research Fellow, Senior Vice President

GEOVIS SinoWeather Technology Co.,Ltd.

AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE

THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

Part 01

About SinoWeather

星图维天信

About US

GEOVIS SinoWeather Technology Co., Ltd.

We are committed to becoming

A leading global provider of meteorological and oceanographic information and services

About SinoWeather

Parent：GEOVIS Technology Co., Ltd.
(GEOVIS, stock code: 688568)
Est. 2007 | Stock: 874126
Beijing (HQ) | Nanchang (Equipment) |
Xi'an/Shaanxi/Nanjing/Jiangsu(R&D)

Business Units

1. **Traditional Meteorology**
2. **Low-Altitude Weather**
3. **Weather Modification**
4. **Pro Services**
5. **Space Services** (Coming Soon)

Milestone

NEEQ Listing: Nov 17, 2023

430+
Headcount

36%
Master's Degree or Above

78%
R&D Personnel

360+
Patents and Software Copyrights

About US

Main Business

Comprehensive Meteorological Industry Chain Deployment → Extensive "Meteo+" Cross-Sector Applications→ Strategic Expansion into Emerging Industries such as Low-Altitude Economy.

Weather Infrastructure

- Observation and detection equipment
- Ground-based observation network
- Ground-based radar network
- Satellite constellation

Weather Information Engineering

- Data governance
- Monitoring & analysis
- Forecasting & warning
- Assisted decision-making

Weather Information Services

- Public welfare
- Commercial Service
- Disaster prevention Service
- Resources development & utilisation

→ Specialised fields / Government / Enterprise / The Public

Weather +

- agribusiness
- Transport
- Finance
- Energy
- Tourism
- Wellness
- ...

+ Strategic Emerging Industries

...

Business scope: Equipment sales, infrastructure construction and operation services; information technology development and services; professional information services; and large-scale engineering construction.

eTAPES 2.0 Release of New Products

eTAPES 2.0

Integrated Multi-domain Meteorological Technology Platform

2013

Satellite-based Remote Sensing

Launch of the Meteorological and Oceanic Satellite Remote Sensing Platform

Construction and Development of Ground Satellite Systems

2016

Analysis and Forecasting

Inauguration of the Forecasting Platform

Integrated Analysis Forecast and Early Warning

2022

Variable-Resolution Adaptive Meteorological Prediction

eTAPES 1.0

Coverage of the entire industrial chain

2023

Integrated Platform for Multiple Domains

Cross-domain Expansion

Deep Integration of Applications across Multiple Domains

2024

Artificial intelligence + seamless + cloudification

The Release of eTAPES 2.0

Intelligent Integration System with Full-link in the Cloud

2025

Internationalization Strategy and Low - altitude Economy

Enhance Scenario Penetration and Serve the Global Community

Expand Strategic and New Industries Offer Global Meteorological Services

Macro-level Layout of Internationalization Strategy

Groupization

Leverage the group-based competition mechanism to cultivate high-quality subsidiaries for capital market entry, ensuring the company's **primary growth trajectory**.

Ecologization

Advance ecological development and scale up the online digital Earth business to establish a **second growth curve**.

Internationalization

Leverage the integrated "space-air-ground-sea" framework to expand multi-layer observation coverage and drive the **third growth curve** through internationalization.

Revenue

Competition Mechanism

Space and Aeronautical Information Ecosystem

Increment of Users

Market Capitalization

AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE

THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

Part 02

Fengyun Meteorological Satellite: From Inversion to Products

星图维天信

FY Meteorological Satellite

1. Remote Sensing Inversion

Research and Development of Fengyun Satellite Application System

Data Source Area

Data Lake
- Fengyun satellite observation data
- Model forecast and re-analysis data

Tianqing Big Data Cloud Platform
- Fengyun satellite observation data
- Meteorological station/sounding/radar observation data
- Model forecast and re - analysis data

Data Processing

Data access → **Data pre-processing** → **Data management process**

Product Output

Cloud and Radiation Category
- Cloud detection
- Cloud amount
- Cloud classification

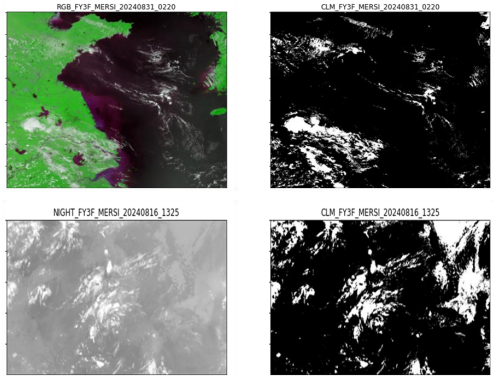
Atmospheric Environment Category
-Aerosol optical thickness/dust Monitoring
-Dust measurement

Land Surface and Sea Surface Category
- Land surface temperature
- Sea surface temperature

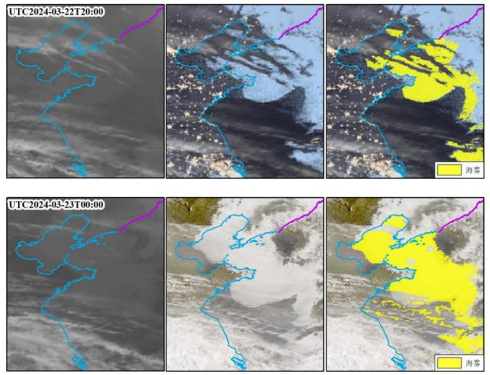
Weather Monitoring Category
- Atmospheric temperature and humidity profiles
- Cloud - derived wind

Fengyun Satellite Quantitative Inversion Products - Cloud Radiation

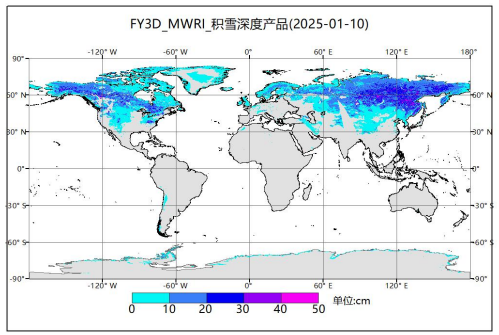
Cloud Mask & Detector



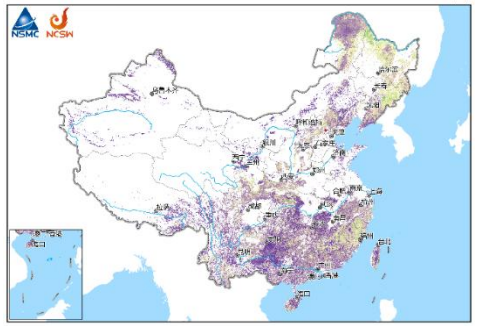
Fog Detection



Snow Depth

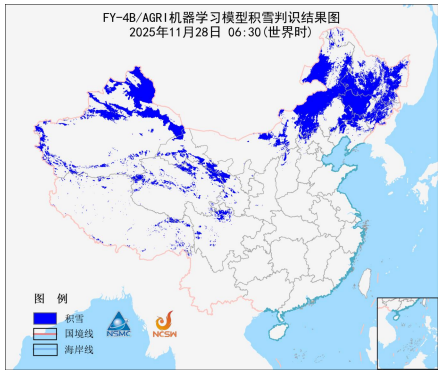


Carbon sequestration



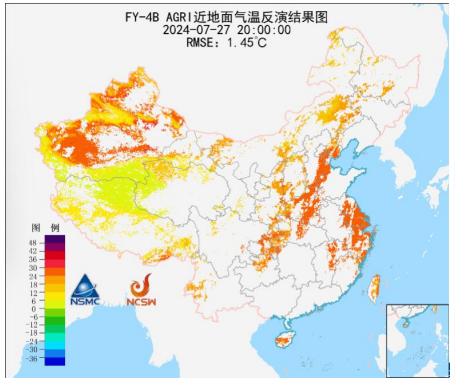
Fengyun Satellite Quantitative Inversion Products - Land Surface and Sea Surface

SnowCover

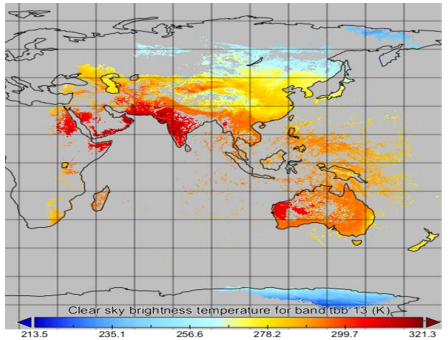


Enteromorpha Monitor

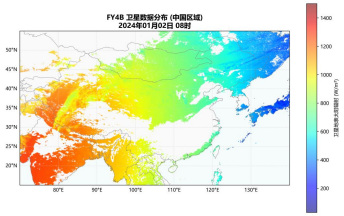
LST



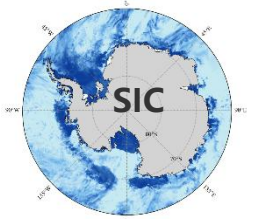
Clear Sky BT



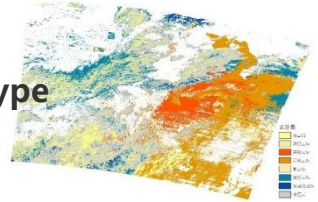
SSR



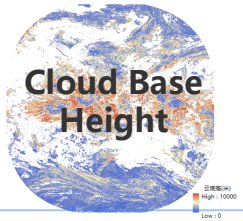
SIC



Cloud Type

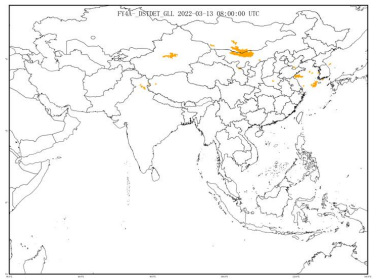


Cloud Base Height

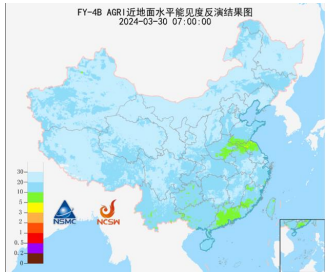


Fengyun Satellite Quantitative Inversion Products - Atmospheric environment

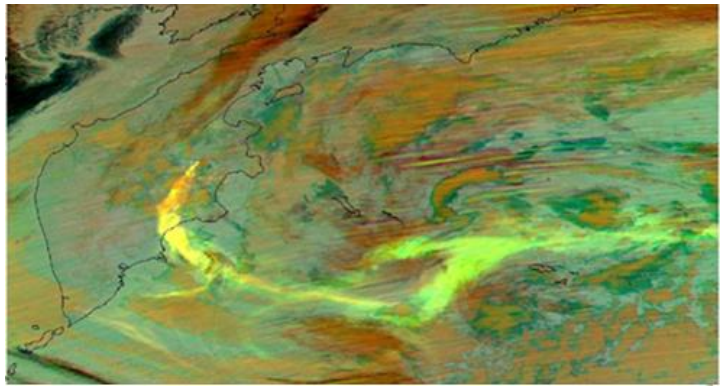
Dust Monitoring



Volcanic Ash Monitoring

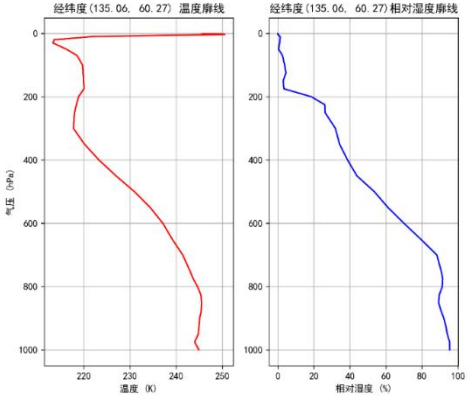


Near-surface visibility

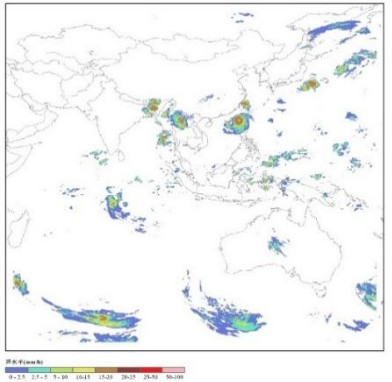


Fengyun Satellite Quantitative Inversion Products - Weather Monitoring

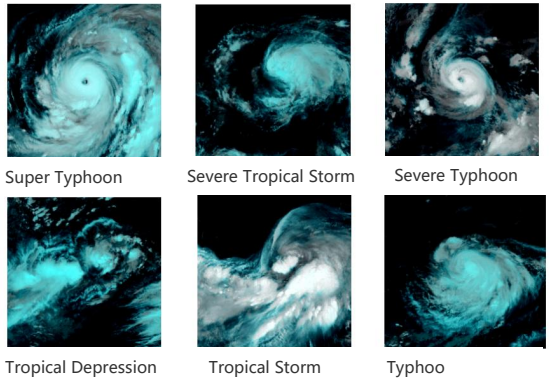
Atmospheric temperature and humidity profile



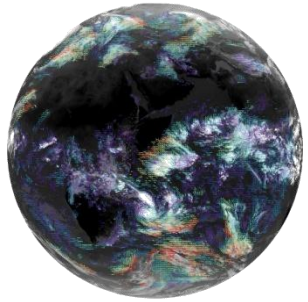
QPE



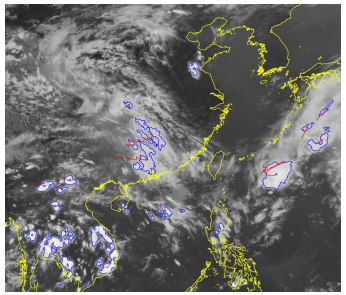
Typhoon intensity estimation



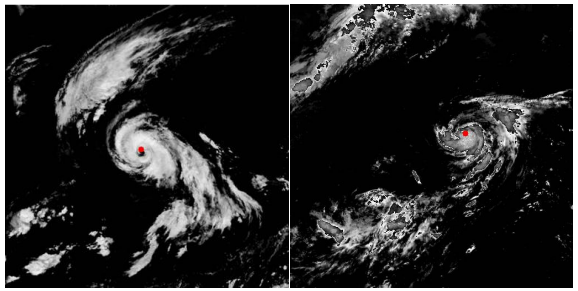
AMW



Convection Cloud



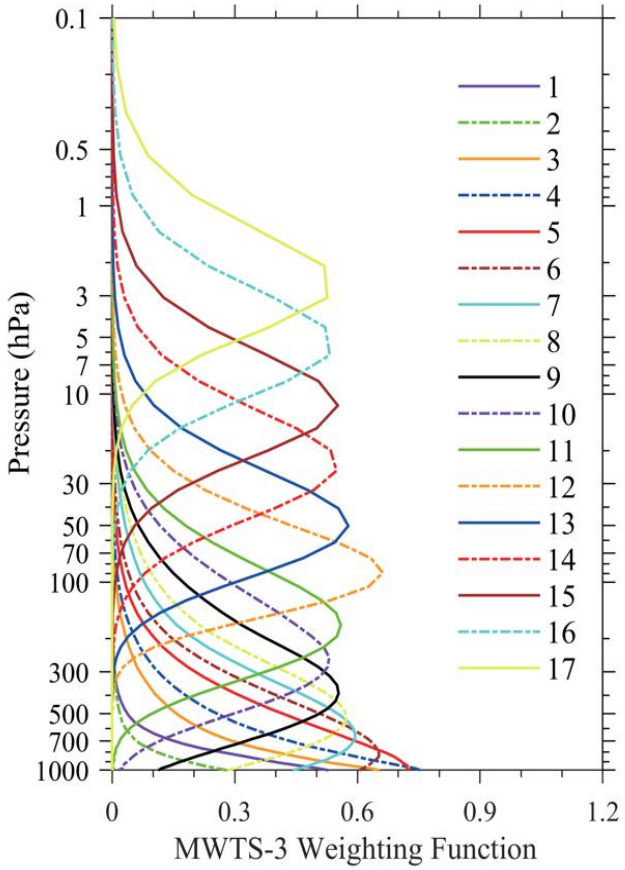
Typhoon Location

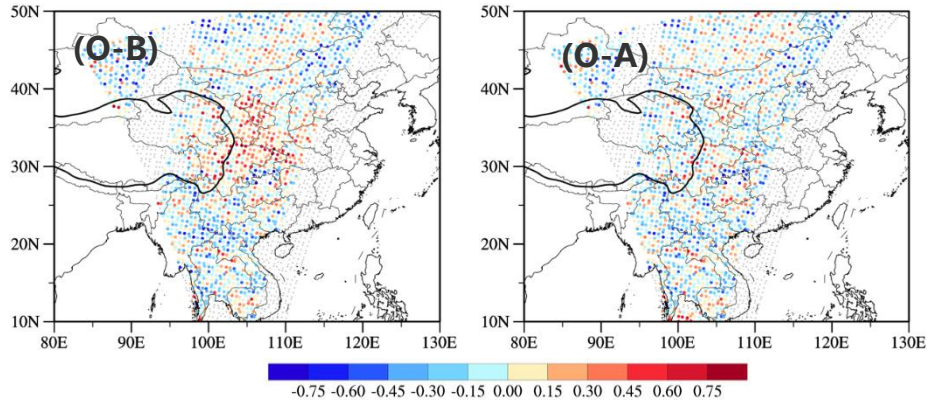


FY Meteorological Satellite

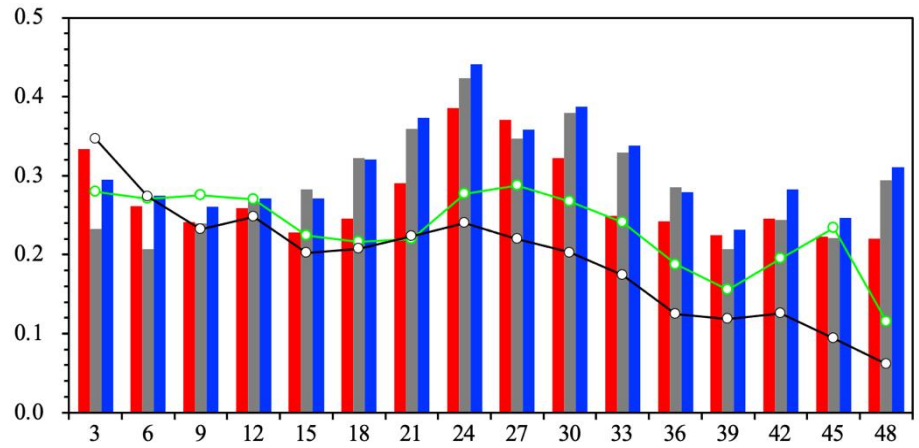
2. Data Assimilation

FY-3E MWTS-3 radiances have been successfully assimilated in WRFDA, significantly enhancing the accuracy of quantitative precipitation forecasts.





Spatial distributions of brightness temperature bias for Channel 9
-Before assimilation (O-B);
-After assimilation (O-A);
-Thick black contour = Areas with elevation > 3,000 m.

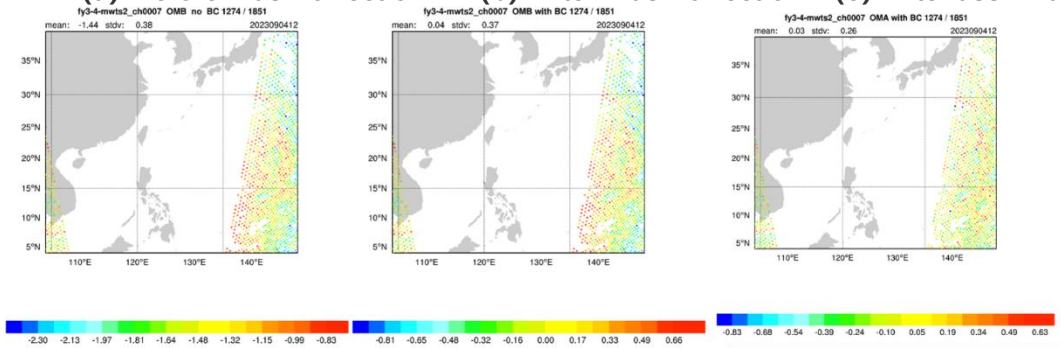


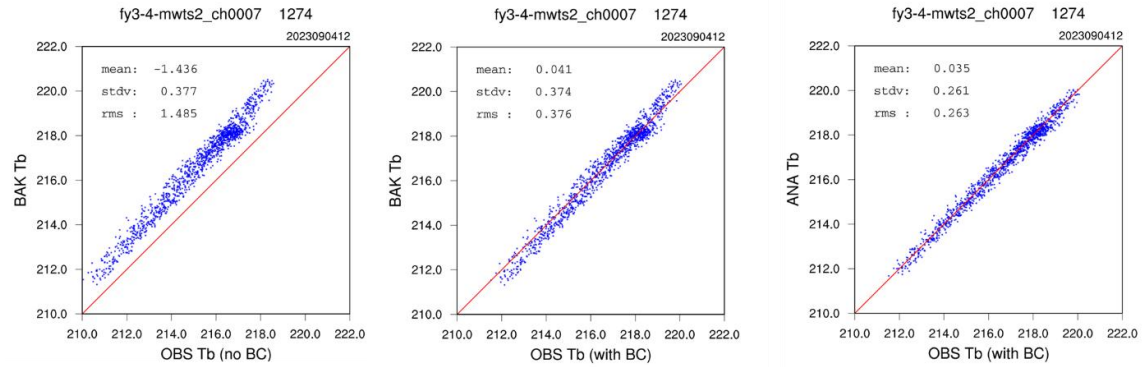
ETS (Equitable Threat Score) for 3-hourly accumulated precipitation forecasts
Red: Assimilation of MWTS-3 radiances only
Grey: Assimilation of conventional observations only
Blue: Joint assimilation of both conventional + MWTS-3 data

The FY-3D satellite's MWTS-II and MWHS-II are now integrated into WRFDA, providing a more realistic initial field after assimilation.

➢ MWTS

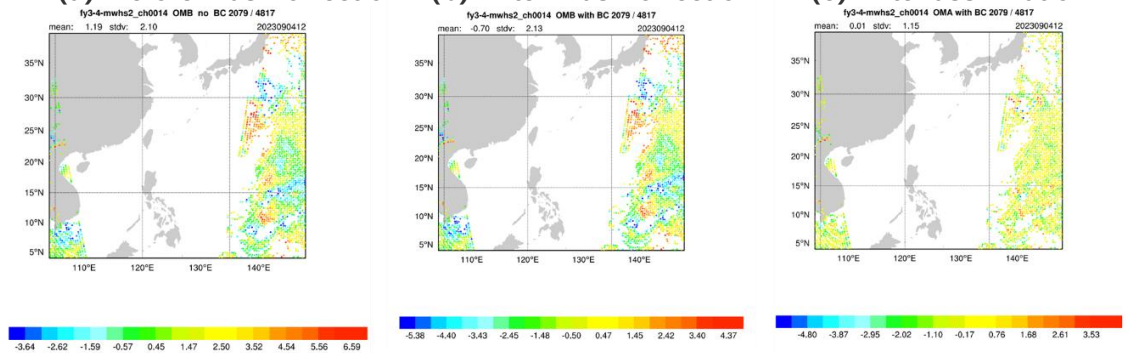
(a) Before Bias Correction (b) After Bias Correction (c) After assimilation

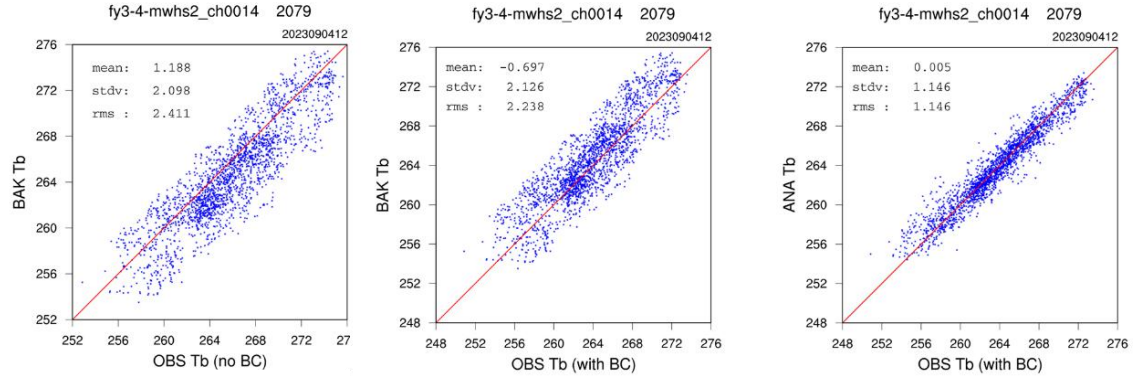


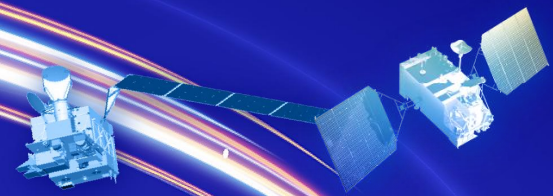


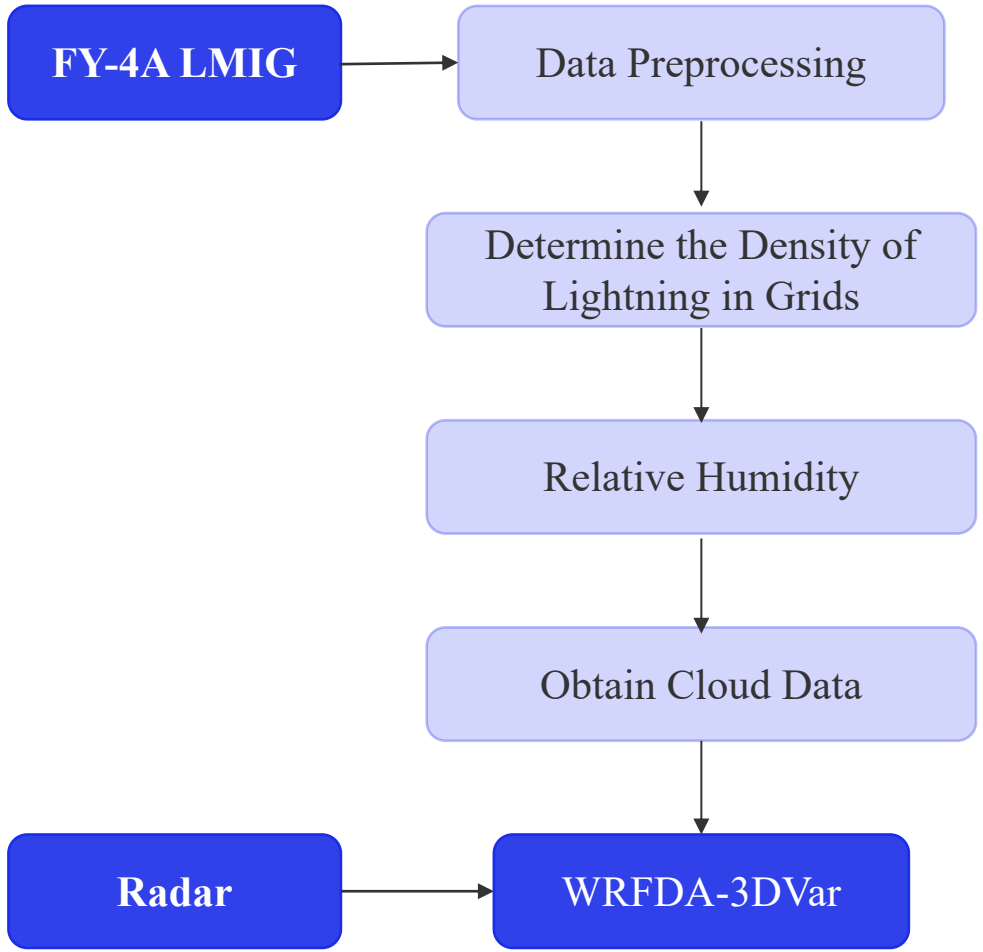
➢ MWHS

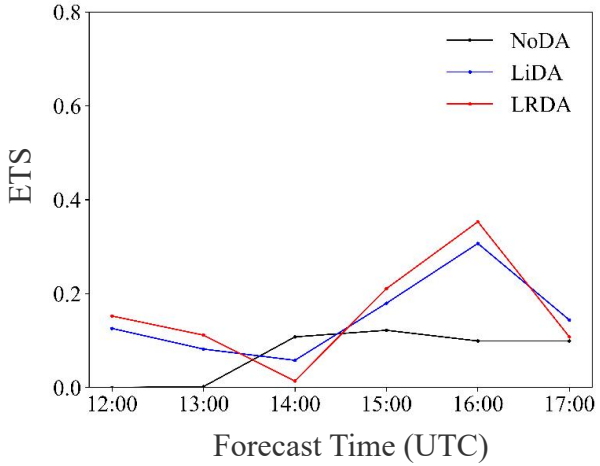
(a) Before Bias Correction (b) After Bias Correction (c) After assimilation



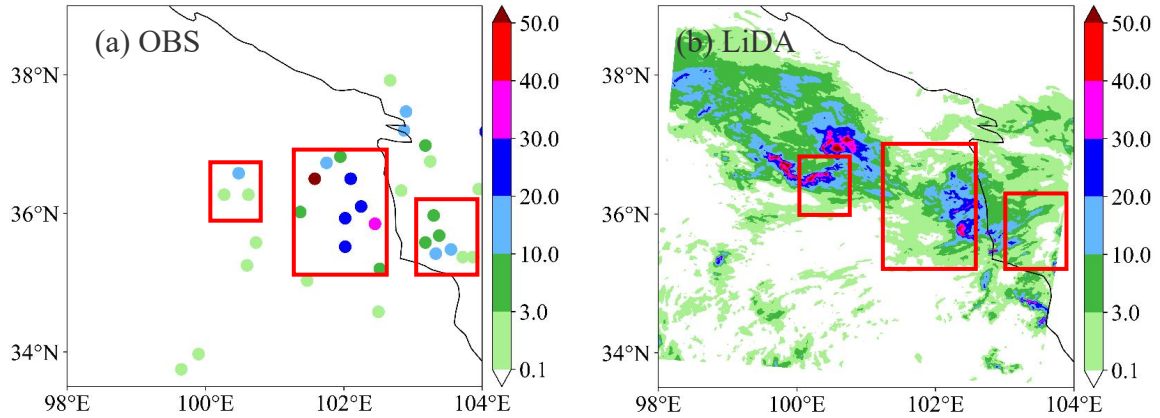








Hourly precipitation forecast scoring: Lightning data assimilation (blue), Lightning combined with radar data assimilation (red)

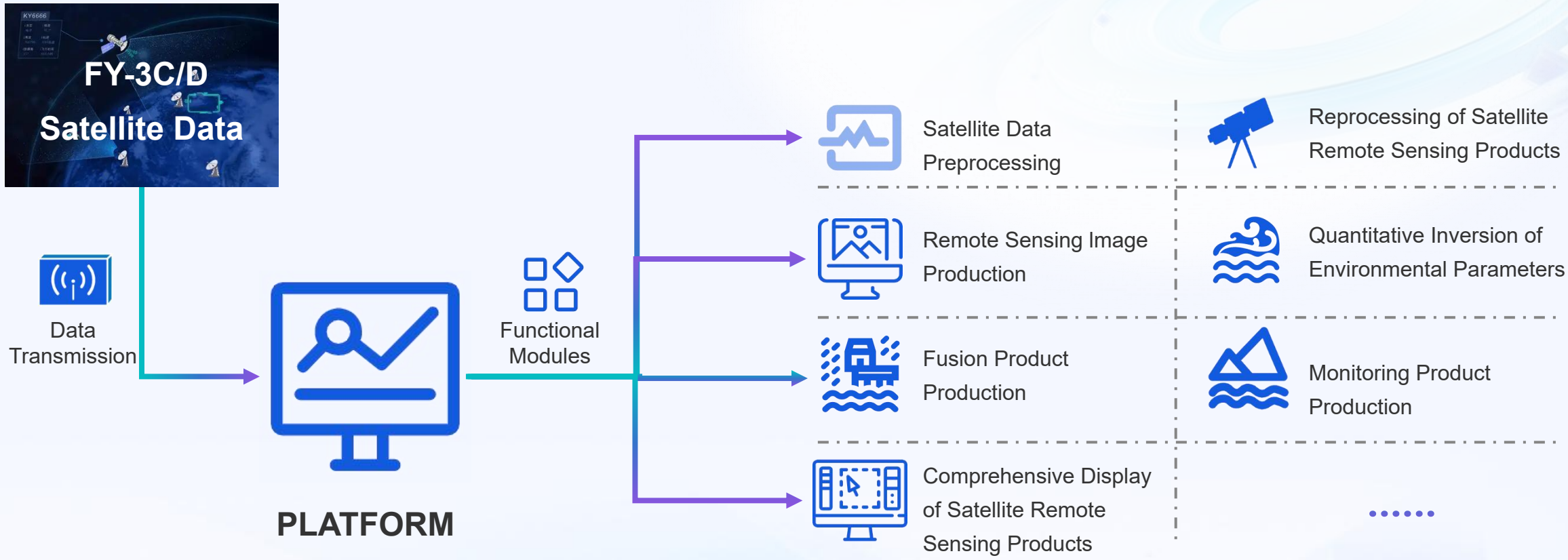


Spatial distribution of forecasts of accumulated precipitation for 6h (12:00-18:00).

FY Meteorological Satellite

3. Remote Sensing Platform Construction

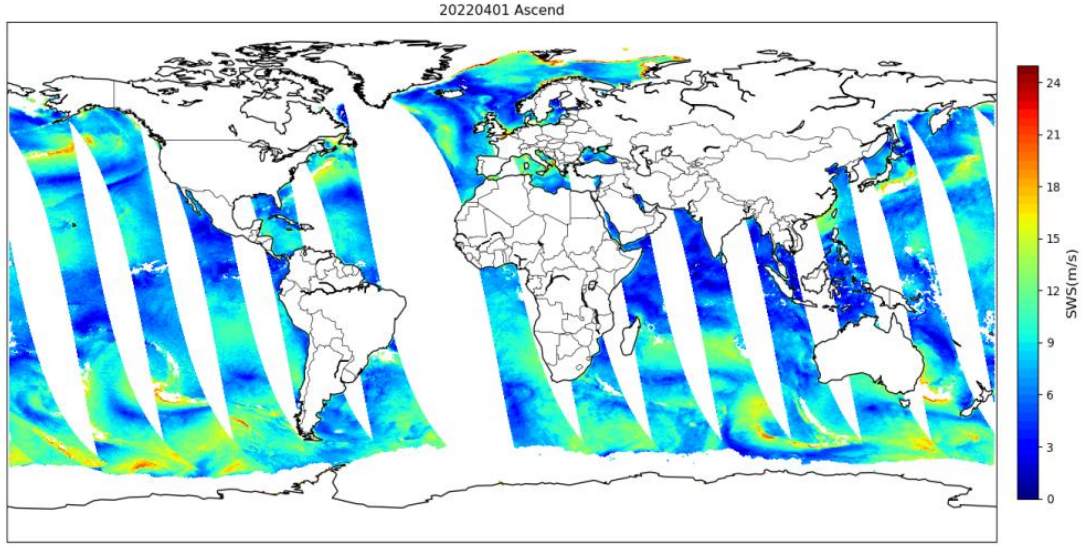
Meteorological and Oceanic Satellite Data Reception, Processing, and Application Platform



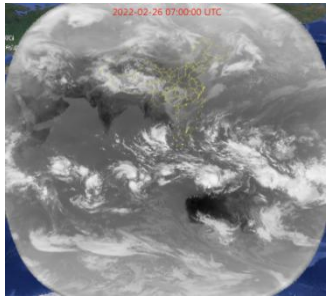
Retrieval Products	Parameters
Sea Surface Temperature	RMS≤1.0℃
Sea Surface Wind Speed	RMS ≤2m/s
Sea Ice Coverage	RE≤5%; Spatial resolution:25km
Cloud	Accuracy≥85%， Resolution1km
Typhoon	Horizontal resolution 1km, Accuracy ≥ 90%
Sea Fog	Horizontal resolution 1km, Accuracy ≥ 90%

Image Products

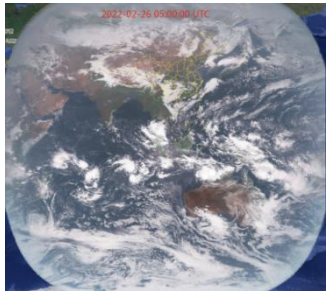
Visible Image	Infrared Image
Water Vapor Image	Microwave Image



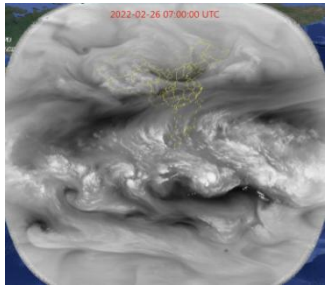
FY3Sea Surface Temperature Image Mosaic



FY4Infrared Image



FY4 Visible Image



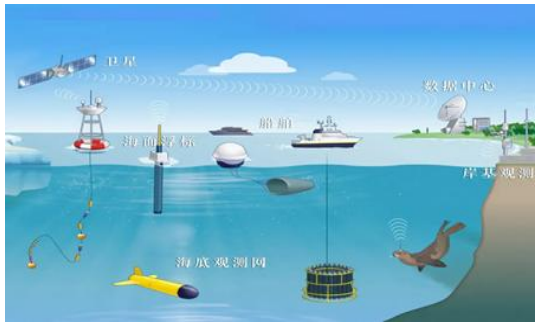
FY4 Water Vapor Image

Introduction to Application Cases of FY Meteorological Satellites Data

Application Scenarios

Monitoring and Early Warning of Marine Hazardous Environments

Marine Navigation Safety Assurance



Marine Ecological Monitoring and Ecological Zone Protection

Development and Supervision of Marine Fishery Resources

Marine Oil and Gas Development Support

Offshore Wind Power Support

AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE

THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

Part 03

FY Low-altitude application

GEOVIS SinoWeather Technology Co.,Ltd.

FY Low-altitude application

Low-Altitude Meteorological Technical Architecture

Architecture of Tianxin•Low-Altitude Weather Service Platform

User

Government | Enterprise | Public | UAV

Software system

Tianxin•Low-Altitude Weather Service Platform

Smart Low-Altitude Weather Forecast		Smart Low-Altitude Weather Operation		Smart Low-Altitude Weather Supervision		Low-Altitude Weather Public Service	
Low-Altitude Weather Overview	Low-Altitude Weather Condition	Real-Time Weather for Low-Altitude Operations	Low-Altitude Flight Mission Airworthiness Evaluation	Comprehensive Low-Altitude Supervision	Low-Altitude Weather Conditions in Full Airspace	Low-Altitude Flight Mission Weather Summary	vertiport Weather Check
Low-Altitude Weather Forecast	Low-Altitude Weather Alarm	Vertiport Weather Warning	Low-Altitude Flight Support	Low-Altitude Weather Forecast Query	Low-Altitude Weather Historical Analysis	Flight activities Weather Check	Route Weather Forecast Check
Low-Altitude Weather Products	Low-Altitude 3D Grid	Flight Window Prediction	Flight Plan Scheduling	targeted release of early warning	Low-Altitude Risk Emergency Management	Low-Altitude Weather Special Report	Intelligent Low-Altitude Weather Q&A

Low-Altitude Weather Safety Assurance System

Low-Altitude Weather Big Data System		Low-Altitude Application Service System		Low-Altitude Weather Asset Sharing System	
Low-Altitude Weather Equipment Monitoring	Low-Altitude Weather Data Monitoring	Low-Altitude Logistics Services	Low-Altitude Tourism Services	Low-Altitude Weather Asset Management	Low-Altitude Weather Audit Management
Low-Altitude Weather Data Submission	Low-Altitude Weather Plug – in Management	Low-Altitude Traffic Services	Low-Altitude Agricultural Services	Low-Altitude Weather Subscription Management	Low-Altitude Weather Asset Management
Low-Altitude Weather Algorithm Management	Low-Altitude Weather System Management	Low-Altitude Emergency Services	Low-Altitude Inspection Services	Low-Altitude Weather Operation Statistics	Low-Altitude Weather Products

Product portfolio

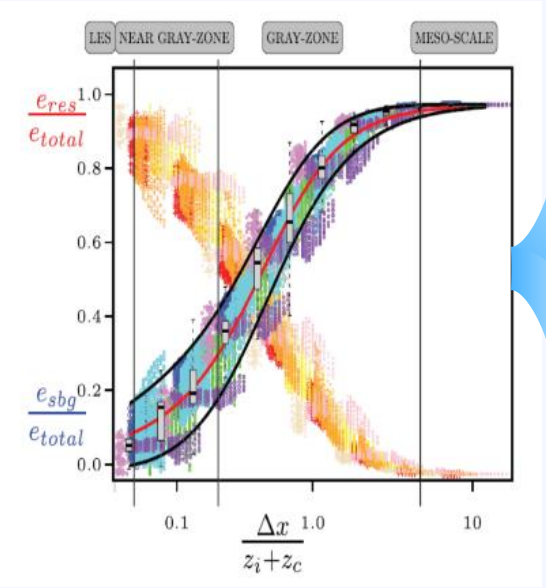
Basic Low-Altitude Weather Product	Low-Altitude Near - Surface Weather Observation and Forecast	3D High - Impact Low-Altitude Weather Diagnosis
	3D Refined Low-Altitude Weather Observation and Forecast	Meter - Scale Block Weather Observation and Forecast
Low-Altitude Specialized Weather Product	Low-Altitude Flight Route Forecast	Low-Altitude Flight Route Warning
	Low-Altitude Flight Window Prediction	Low-Altitude Operation Plans Support

Basic platform

GEOVIS CLOUD | eTAPES2.0 Multi-Domain Comprehensive Meteorological Technology Platform

FY Low-altitude application

WTX Low-altitude Weather Forecast Model

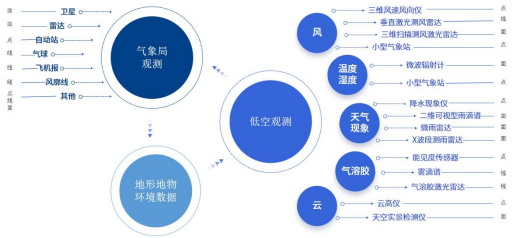


Weather Radar

Satellite

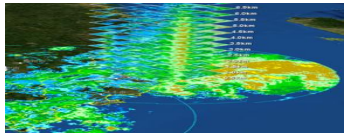
observation Station

Kilometer-scale Weather Forecast



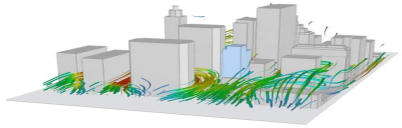
Low-altitude Refined Observation

Data fusion and Assimilation



3D Forecast with a resolution of 100m

LES



Meter-level 3D Forecast of Blocks

Strong Wind

Wind Shear

Severe Convection

Turbulence

- Intelligent Perception
- Quick generation
- 3D Evolution
- Minute-level Update

FY Low-altitude application

Low-altitude Meteorology Core Product Offering

Meteorological Products near the Surface	Minute-scale precipitation	Phase state of precipitation	Intense convection	Basic element forecasting
Three-Dimensional Elemental Products	Three-dimensional meshes weather observations	Three-dimensional meshes meteorological forecast	Meter-scale block-level real-time conditions	Nowcasting
Products of High-Impact Weather Events	Turbulence	Horizontal wind shear	Vertical wind shear vector	Low-level clouds
	Reduced visibility	Thunderstorms	Icing	Turbulence
Scene-themed Application Products	Whether it is flight - suitable	Flight route planning	Operating time window	Risk influence index

Three-dimensional factors:
Three - dimensional temperature, humidity, wind velocity, wind direction, cloud amount, precipitation, visibility.

Weather with high impacts:
Horizontal and vertical wind shear, turbulence, icing, cloud base altitude, cloud top altitude, poor visibility conditions, low-level clouds.

Horizontal resolution: 500m/100m

Vertical resolution:

- **0-120m, 10m;**
- **120-300m，20m；**
- **300-1200m，100m.**

Forecasting resolution:
Over the next 24 hours, at 10-minute intervals.

Observed resolution: Ten minutes

FY Low-altitude application

Low-altitude Meteorology Scene Thematic Applications

Low-altitude scene thematic applications include five categories and over 15 data interfaces, providing a variety of meteorological layer products. Accurate meteorological data, accessible via standard APIs and SDKs, can be seamlessly integrated into diverse low-altitude applications—such as logistics, tourism, inspection, and agriculture—enabling broad utilization and deep empowerment of meteorological information.

Title of the Product	Name of the Interface
Products of Three - Dimensional Meteorological Data for All Scenarios	Basic meteorological elements: Observations and Forecasts
	In-situ Diagnosis, Forecasting, and Early Warning of Hazardous Weather
Products for Assisted Flight Mission Planning	The 24 - hour Meteorological Forecast Prior to Flight
	Three-Dimensional Meteorological Risk Forecasting and Early Warning for the Full Flight Route
	Meteorological Safety Assessment for Airfield Takeoff and Landing
	Meteorological Safety Assessment for the Complete Flight Path
	Optimal Window Forecasting
	Optimized Flight Route Planning

Title of the Product	Name of the Interface
Meteorological Assurance Products during the Flight Process	Real-Time Three-Dimensional Meteorological Monitoring During Flight
	Intelligent Three-Dimensional Risk Assessment and Early Warning for the Entire Flight Route
	Dynamic Flight Route Optimization and Adjustment
Products for Post - flight Diagnostic Analysis	Meteorological Safety Early - Warning Model
	Evaluation and Validation of Model Efficacy
Products for the Assessment of Airspace Climate Resources	Airspace Resource Assessment

AOMSUC-15 FYSUC-2025

FIFTEENTH ASIA-OCEANIA METEOROLOGICAL SATELLITE USERS' CONFERENCE

THE JOINT 2025 FENGYUN SATELLITE USER CONFERENCE

Part 04

Global Weather Services

星图维天信

GEOVIS SinoWeather Technology Co.,Ltd.

International Business Planning

International Applications of FY Meteorological Satellites

Fengyun Meteorological Satellites

- 21 FY meteorological satellites across two generations and four types.
- Global coverage, high precision, and full quantification.
- A networked observation system for high-and low-orbit meteorological satellites.
- Reaching the international advanced level.

GEOVIS

中科星图
GEOVIS

- Meteorological Data Governance
- Meteorological Monitoring and Analysis
  Meteorological Forecasting and Warning
- Meteorological Decision Support

…

International Market

Malaysia

Saudi Arabia

Laos

Thailand

…

API
APP

SaaS
SDK

Service Scenarios

Commercial Space

+ Industrial internationAlization

Low-Altitude Economy

Deep-sea Technology

Meteorology +

- Agriculture and Forestry
- Transportation
- Finance
- Energy
- Travel and Tourism
- Wellness and Elderly Care

Tropical Rainstorm Disaster-Driven Precision Forecast Demand - Minute-Scale Rainfall Forecast for Malaysia

Provides temperature, humidity, wind, precipitation, and fog forecasts with 5 km hourly updates up to 120 hours ahead, and 1–2 km grid minute-level precipitation forecasts up to 120 minutes ahead.

Malaysia's Climate Risks

Year-round Influence:

Intertropical Convergence Zone (ITCZ)&Monsoonal cloud systems

Intense local convection→Rainfall > 50mm/within 30min→Major Hazards

- Urban flooding
- Landslides
- Transportation paralysis

Global models (ECMWF, GFS) Limitations

Low update frequency

- Horizontal resolution >9 km

Cannot resolve:

- 2 km-scale urban heat island circulations
- Land–sea breeze convergence lines

Urgent Demand

DUAL-TRACK FORECASTS

⏳ 5-day hourly | ⏱ 2-hour minutely

FOR WHOM?

Gov | Plantations | Ports | Residents

ACTIONS DRIVEN

Stop construction → Drainage ops → Road alerts

Satellite-Based Radar Echo Reconstruction Model: Building Global Minute-Level Precipitation Awareness

01

Technical Background and Challenges

Traditional Radar Limitations:

- Limited ocean/remote area coverage
- High maintenance costs

Satellite Advantage:

- Geostationary satellites:
- Wide coverage + high-frequency observation
- Inverts multi-channel brightness temperature → reconstructs minute-level precipitation fields
- "See rainfall radars cannot see" → Builds global radar-like capability

02

SegFormer Transformer for Precipitation Nowcasting

Models:

Feature Extraction + Context Modeling+ Reconstruction Decoding

Workflow:

Satellite BT → Feature Extraction → Context Modeling → Decoding → Radar Reflectivity Field

Results:

Translates satellite data into global-level minute-level precipitation dynamics

03

Core Results and Validation

Accuracy Leap:

- 20–30% higher echo structure restoration vs. traditional statistical methods
- 1 km spatial + 6-minute temporal resolution
- Captures local convective structures (e.g., storm cells)

Global Coverage:

- Oceanic precipitation monitoring enabled (radar-dark zones covered)

Validation Reliability:

- High consistency with observed radar data

Online Internationalization Progress

Business Opportunity Aspect

Transsion

- ✓ As of June 30, the contract has been executed and archived.
- ✓ The counterparty has appointed a new product lead; a coordination visit has been completed, and the supplier management backend is under development.
- ✓ The comprehensive service is projected to commence testing in September, with a limited release scheduled for October.
- ✓ The overseas disaster recovery solution has been deployed and verified.

Manxing Technology

- ✓ Service approach: Develop native weather widgets with click-through navigation to H5 pages, including secondary-level interfaces, and enable monetization via H5-based advertising.
- ✓ Traffic base: Approximately 15 million existing users, with about 5 million located in Europe and America.
- ✓ Revenue sharing ratio: Currently under negotiation; the counterpart typically allocates 30%, with 70% allocated to our side.
- ✓ Anticipated Progress: Widget design is underway, with completion and delivery scheduled for mid-August and launch expected in September.

Overseas Operations of Xiaomi

- ✓ Service Methodology: Develop the "Journey of the Sun and Moon" widget, which redirects to an H5 page upon click, with monetization achieved through advertising.
- ✓ Traffic Foundation: The widget is projected to reach a user base of tens of millions. Revenue share: Under negotiation (standard split is 3:7, partner 3, us 7).
- ✓ Progress Projection: Widget design and development are underway, with completion and delivery scheduled for August and launch expected in September.

Business Opportunities in the Engagement Phase

OPPO Overseas

GWM

Overseas operations of Great Wall Motor

iStone

- ✓ iStone has won the bid; the business opportunity is closed, and the contract is being finalized.
- ✓ Provide basic weather services for overseas vehicle models.

Establish a Dedicated Internationalization Team

- ✓ Team leader: Decai Feng; Team members: Zhixue Ma, Yuting Liang
- ✓ Participate in the September China International Fair for Trade in Services (CIFTIS) with internationalization as the core strategic focus.
- ✓ Developing a complete set of English promotional materials for SinoWeather (70% complete).

Global Service-oriented C-End Capabilities

Weahunter

Scan the QR code to download the App

The Weahunter App delivers accurate, visual forecasts— meeting daily life needs of general users, while supporting professional research and production with deep meteorological data.

90-day extended forecast

15-day forecast anomaly alerts

Detailed actual situation reports

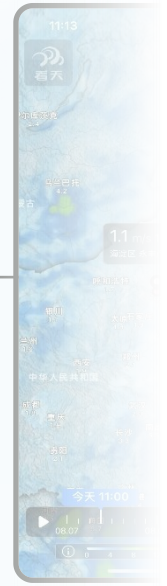
actual situation record queries

Visualised meteorological planet

Visualised meteorological planet

Sun & Moon Movement

Blue skies & evening clouds



Global Service-oriented C-End Capabilities

Tianxin Low-altitude Access APP delivers convenient, real-time, and precise low-altitude meteorological services for personal flight. Featuring scenario-based expansions, it provides personalized weather alerts, flight planning tools, and guidance to meet diverse needs of consumer pilots and enthusiasts.

Take-off and landing point weather query

Vertical height weather and flight forecast

Visualisation of low-altitude meteorological elements

Low-altitude service special report

星图维天信

Delivering Premier Meteorological Services for Human Well-being!

GEOVIS SinoWeather Technology Co.,Ltd.