Radar Mosaic Integrated with Fengyun Satellites for Southeast Asia

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HuaFeng Meteorological Media Group

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Huafeng Meteorological Media Group

中国天气

Public Meteorological Services

National-level | Television, Online Platforms, New Media & We-Media, Operational Development, Integrated Resource Management

Software Services

Undertakes meteorological software development and integration.

Professional Meteorological Services

Provides specialised meteorological services for specific industries and explores international meteorological service markets.

Professional Meteorological Services

Major Transportation

- Marine Meteorological Navigation Service
- Aviation Meteorological Service
- Railway Meteorological Service

Energy and Electricity

- New Strategy for National Energy
- Reliable Energy provision
- New Electricity System

Risk and Finance

- Natural Disaster Risk Model
- Weather Risks in Bulk Agricultural Futures Market

Our Purpose

Globalization

- One-stop service
- End-to-end services of production / transportation / marketing

Scenario-based

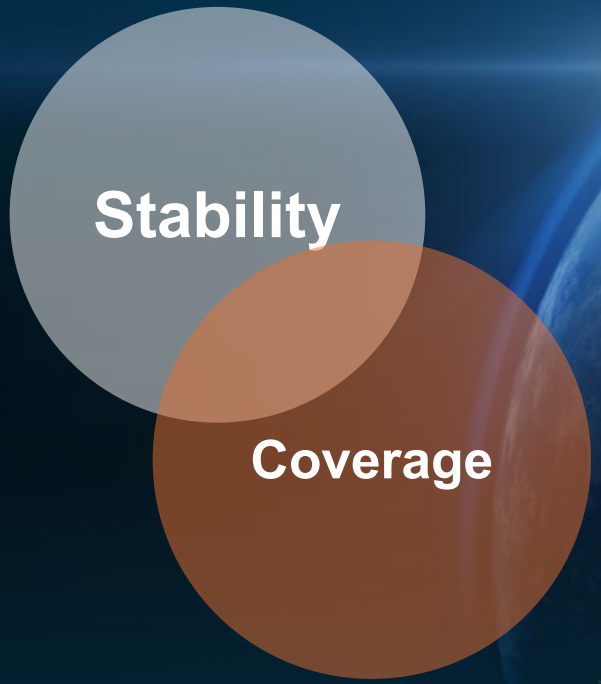
- Custom strategy for each product
- Tailored solution for each enterprise

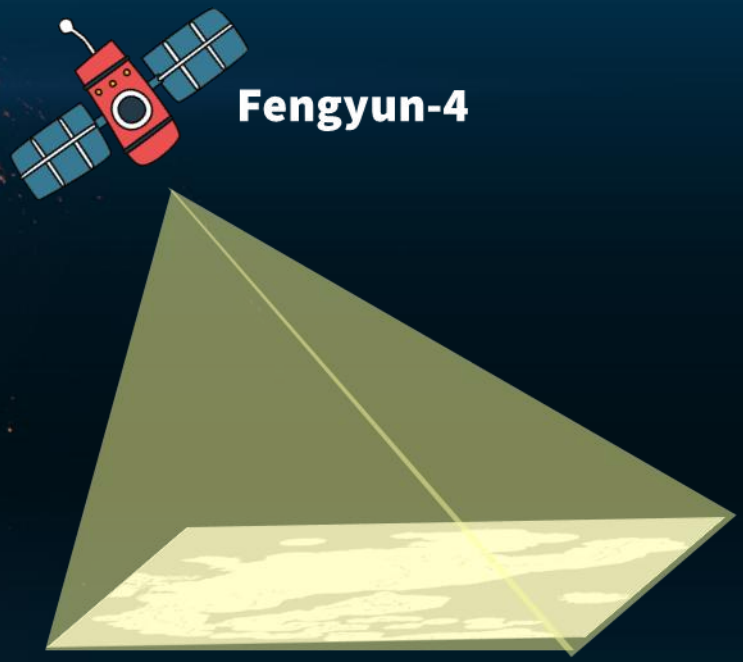
Southeast Asia

The Belt and Road Initiative

Transportation Weather Risk Monitoring: Radar

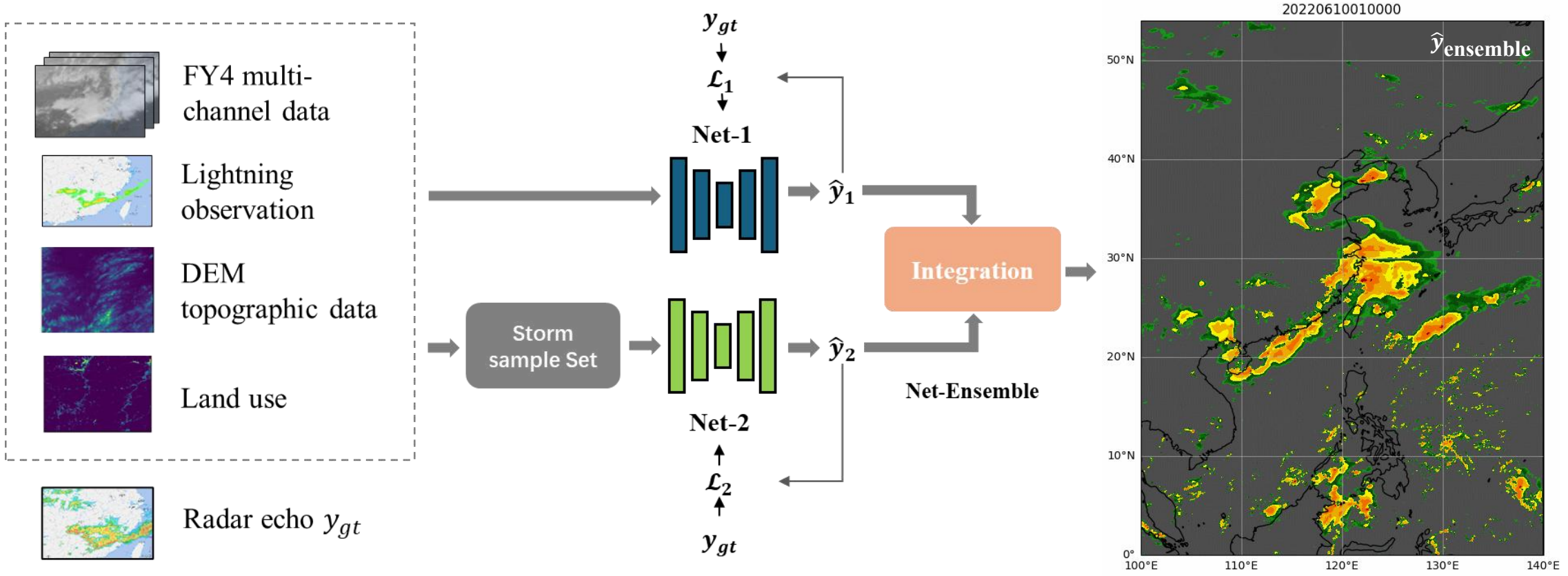
Challenges





1. FY-4 Satellite-based Radar echo Retrieval Model

Constructed a deep learning model based on U-net to achieve retrieval of radar combination reflectivity, using FY-4 multi-channel data, ground-based lightning observations, DEM, and so on.



Retrieval Product

Range	|	15°S~60°N, 60°E~170°E
Spatial Resolution	|	0.01°×0.01°
Frequency	|	about 15min (same as FY-4)
Elements	|	radar combination reflectivity

Independently Test

Retrieval radar combination reflectivity in China every 30min from July 1st to 30th, 2024.

MAE	TS	HIT	POD	FAR
2.35dBZ	36.70%	57.54%	50.11%	6.30%

2. Retrieval Radar Echo Correction Model

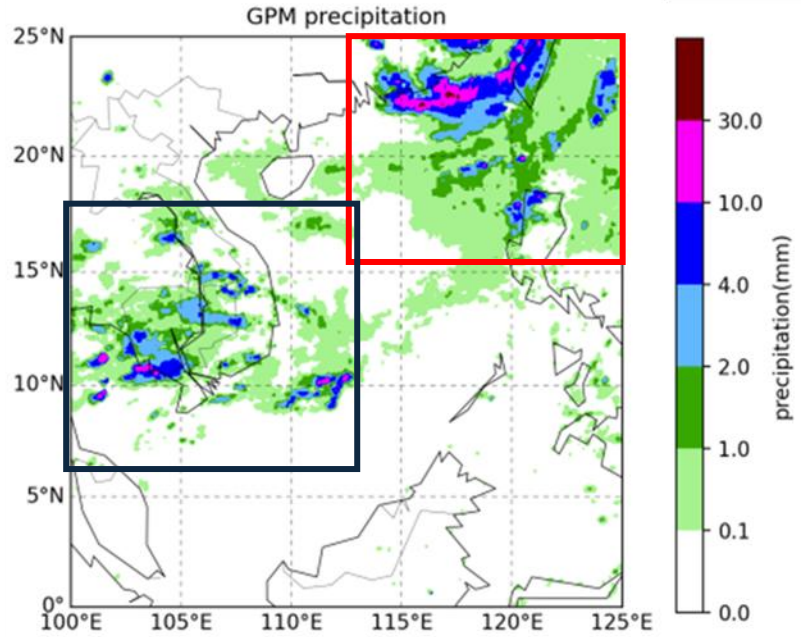
Constructed a correction model using probability density matching method, referring to satellite precipitation improvement method (Yu et al., 2013) .

Test	MAE	TS	HIT	POD	FAR
Before	2.35dBZ	36.70%	57.54%	50.11%	6.30%
Correction	2.45dBZ	36.55%	57.64%	49.76%	6.24%

Radar Echo		TS	HIT	POD	FAR
≥50dBZ	**Before**	0.55%	2.38%	0.71%	0.01%
	Correction	**5.63%**	**7.87%**	**16.53%**	0.09%

Typhoon Gaemi （July 25th, 2024）

Super Typhoon. Developed on July 20, 2024, east of the Philippines. Landed in Taiwan on July 25, causing 10 deaths and 897 injuries. Caused severe flooding in Fujian, Zhejiang, Jiangxi, and Guangdong, with direct economic losses of ¥5.79 billion.



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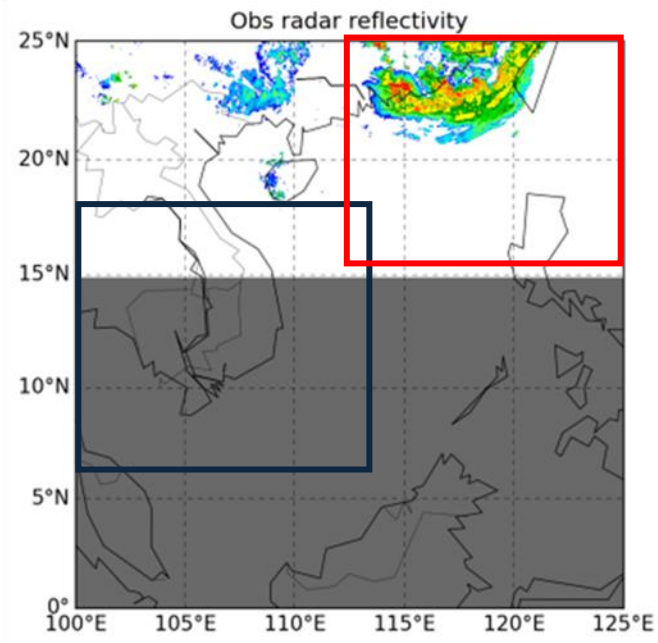
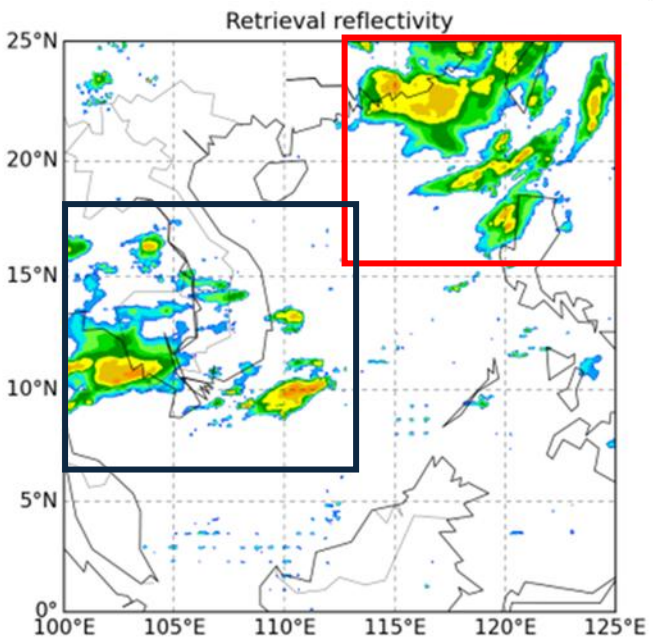
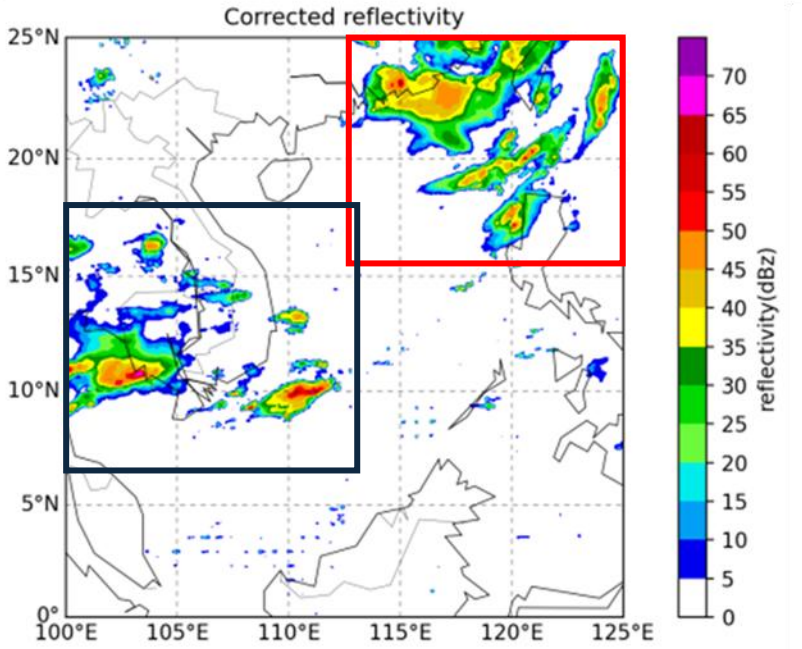


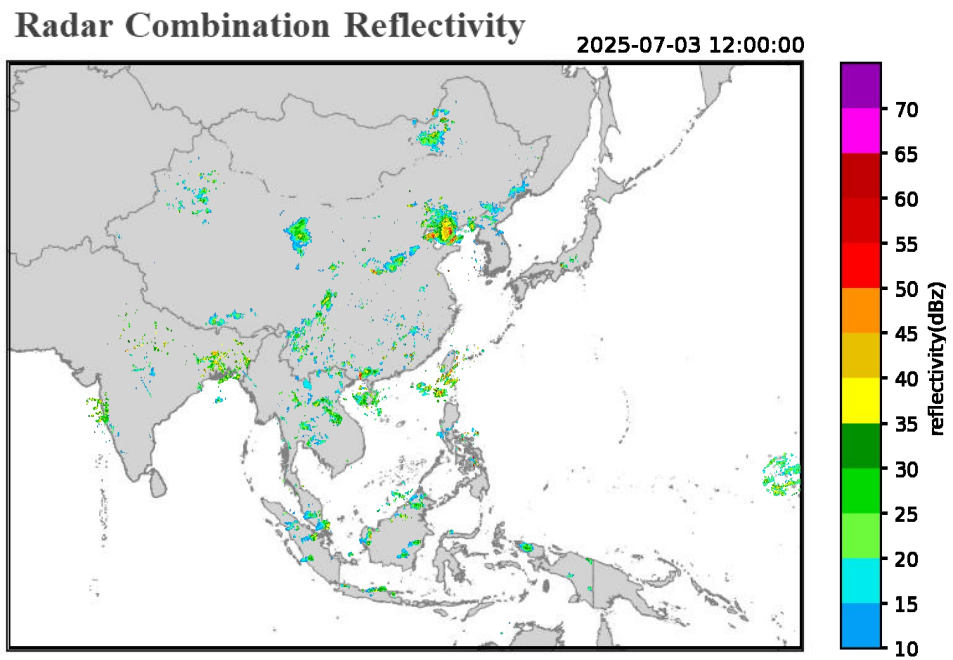


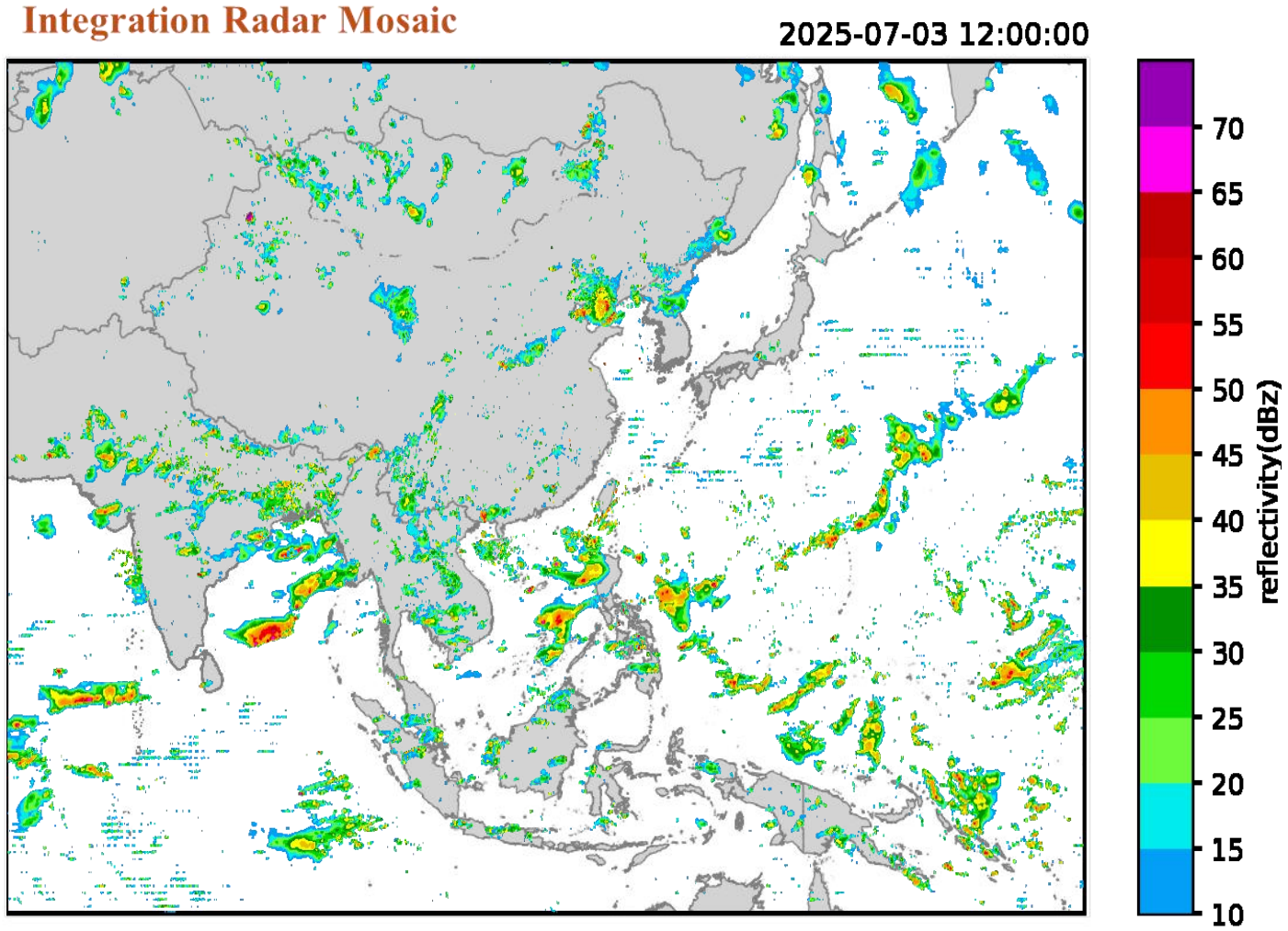


Integration Radar Mosaic

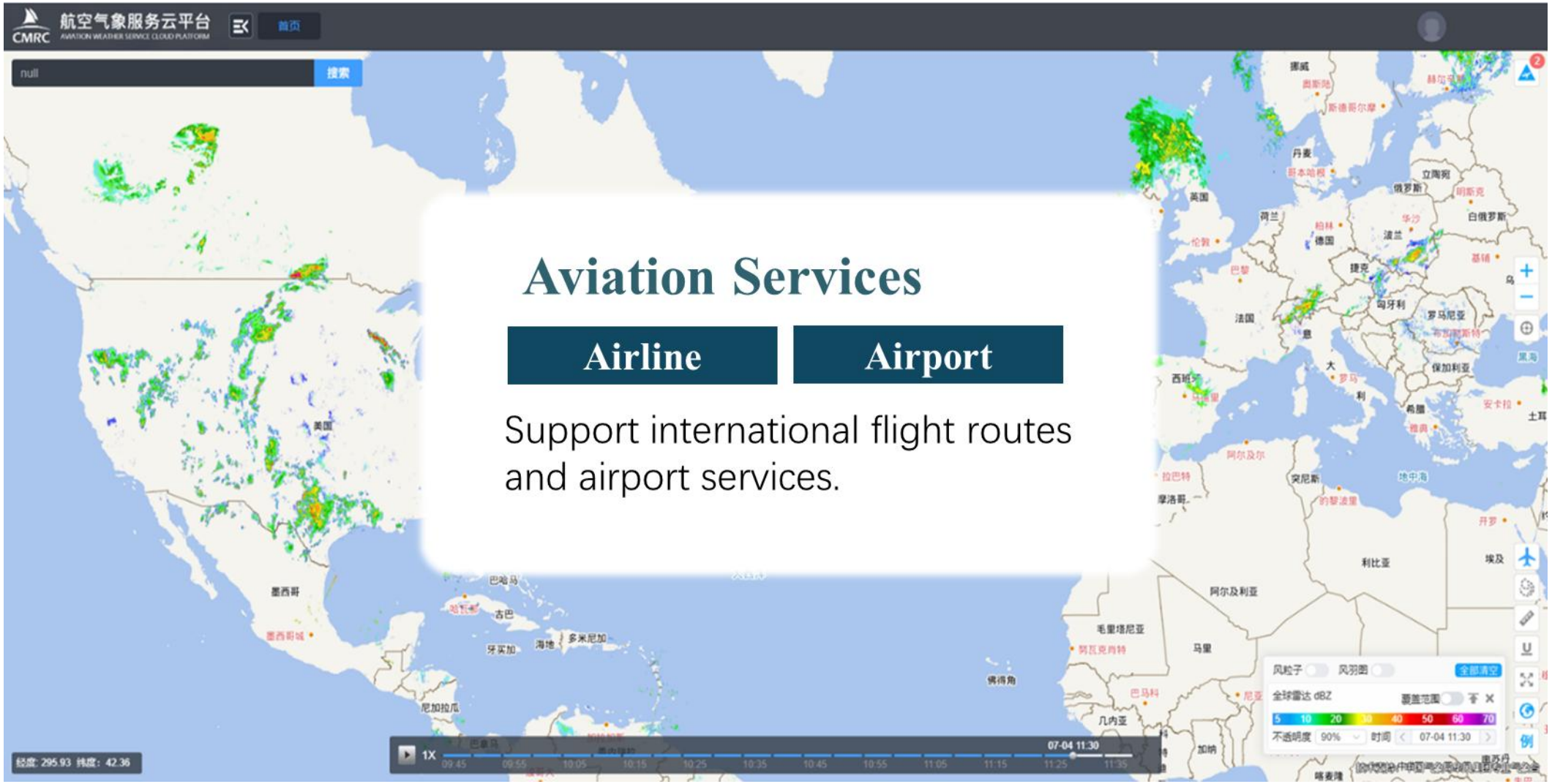
Ocean-Land Panoramic Radar View

A real-time sea land panoramic meteorological solution for Southeast Asia based on multi-source data fusion and artificial intelligence technology.





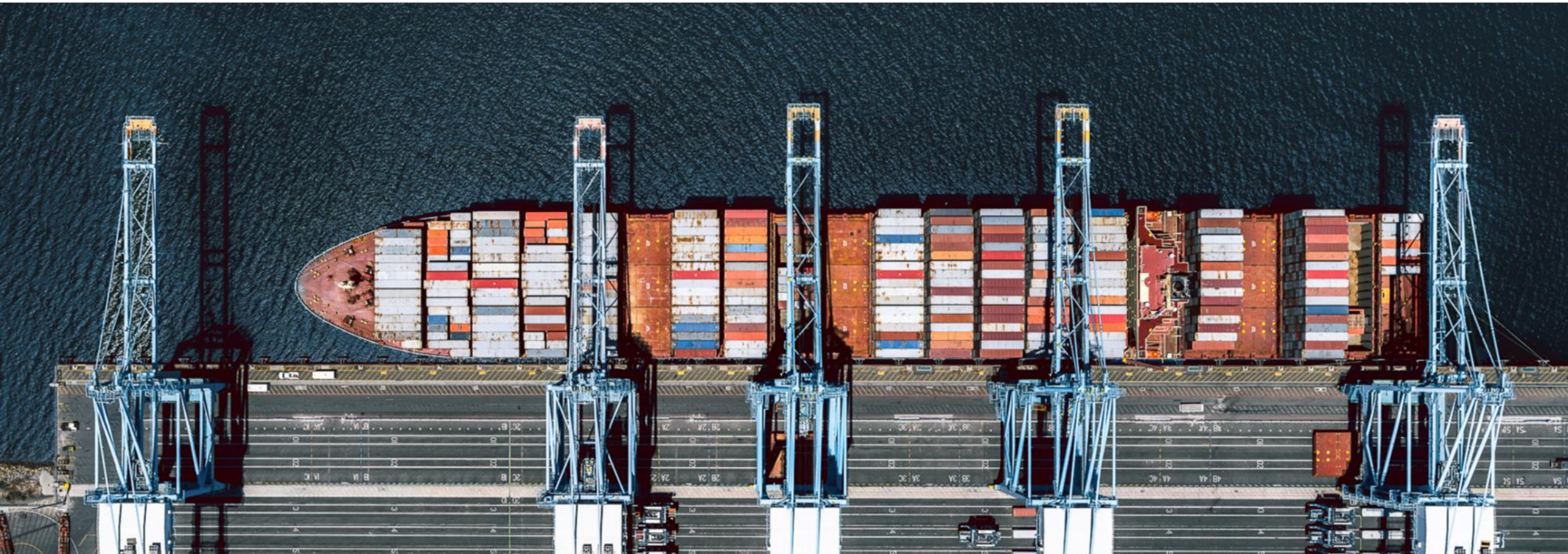
Applications



Marine Services

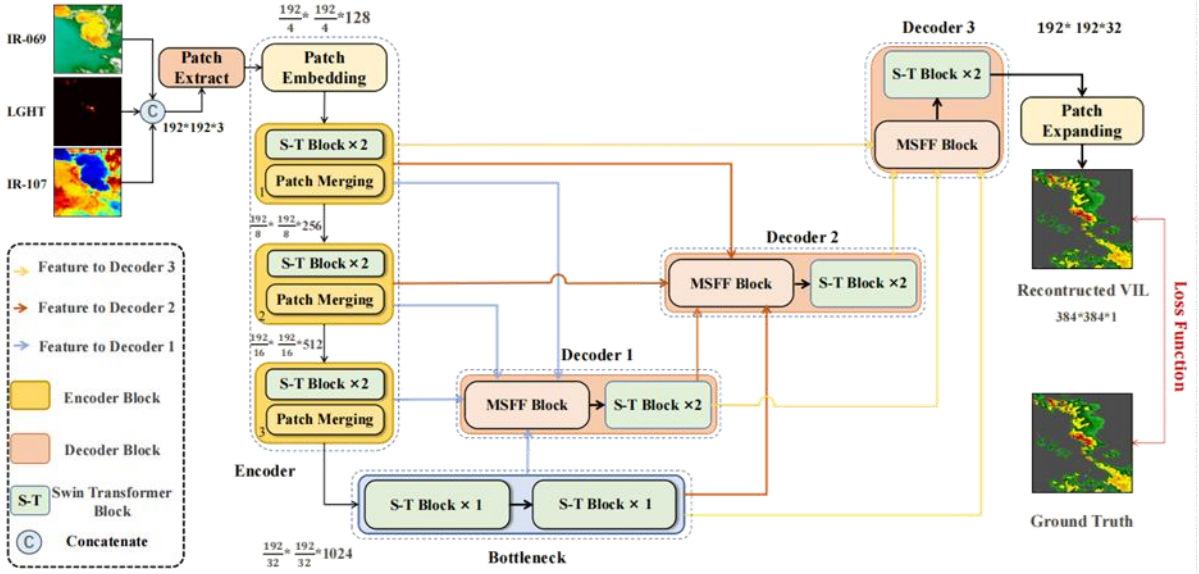
Shipowner **Port** **Rescue Team**

Support weather risk assessments for port cargo handling, planning of vessel routes, and maritime search and rescue.

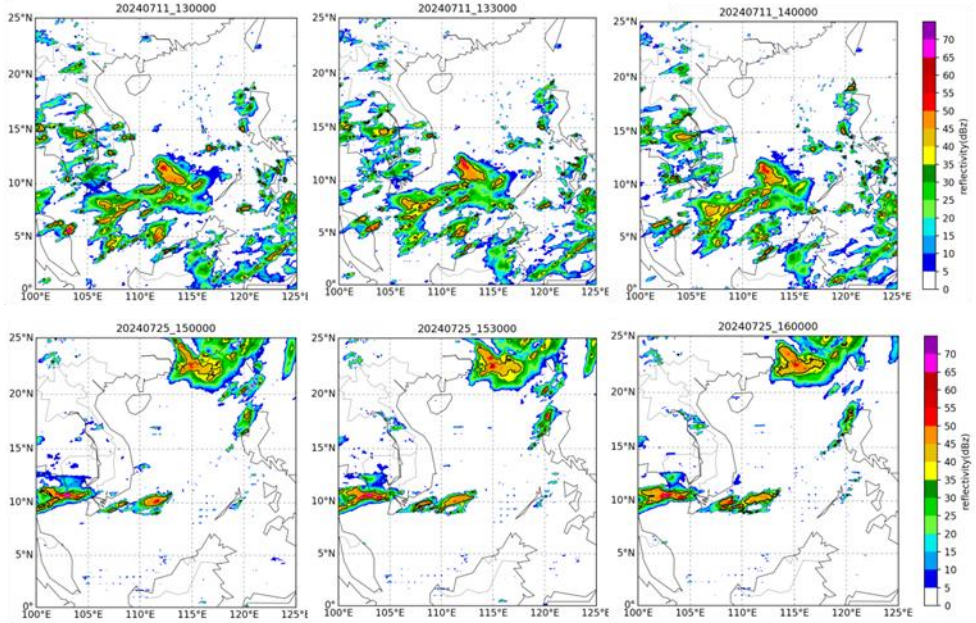


In Future

- Global retrieval radar echo model based on foreign satellites (GOES-16)
- New retrieval variables based on satellite (Vertically integrated liquid)
- Derivative products based on retrieval radar (Severe convective identification, Nowcasting)



J. Li J. Li, Z. Zhou, X. Zhao et al. (2025)



Fine and Accurate

Professional Meteorological Services in the Global

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- One-stop service
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The End

Thank You for Listening

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