Products from FY2C Meteorological Satellite

Xu Jianmin

May 30 2005

FY2C Data Processing Team

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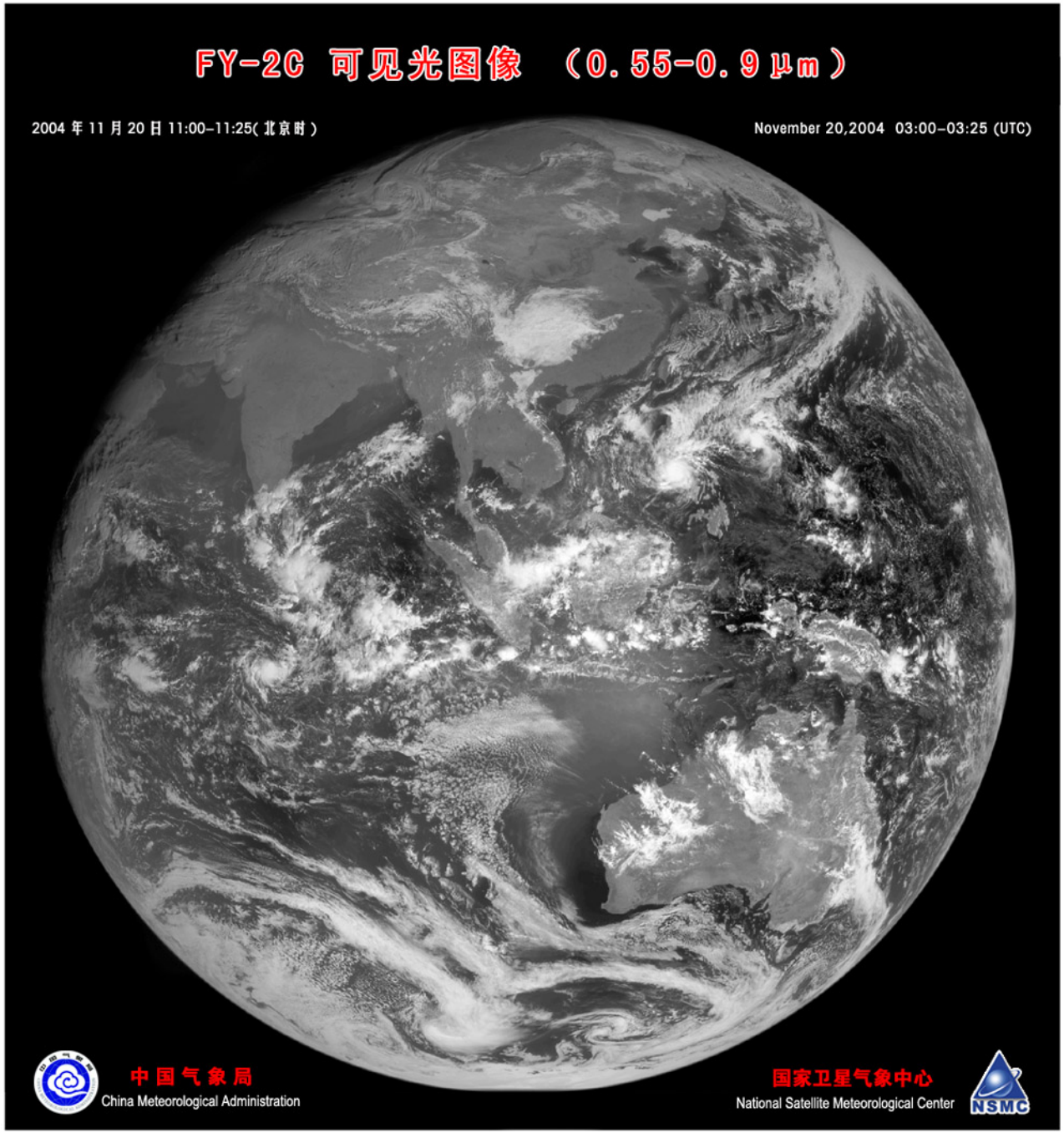
Content

- General introduction to FY2C
- FY2 image registration, navigation, calibration status
- Products from FY2C

FY2 Meteorological Satellite

FY-2C 5 Channel Radiometer

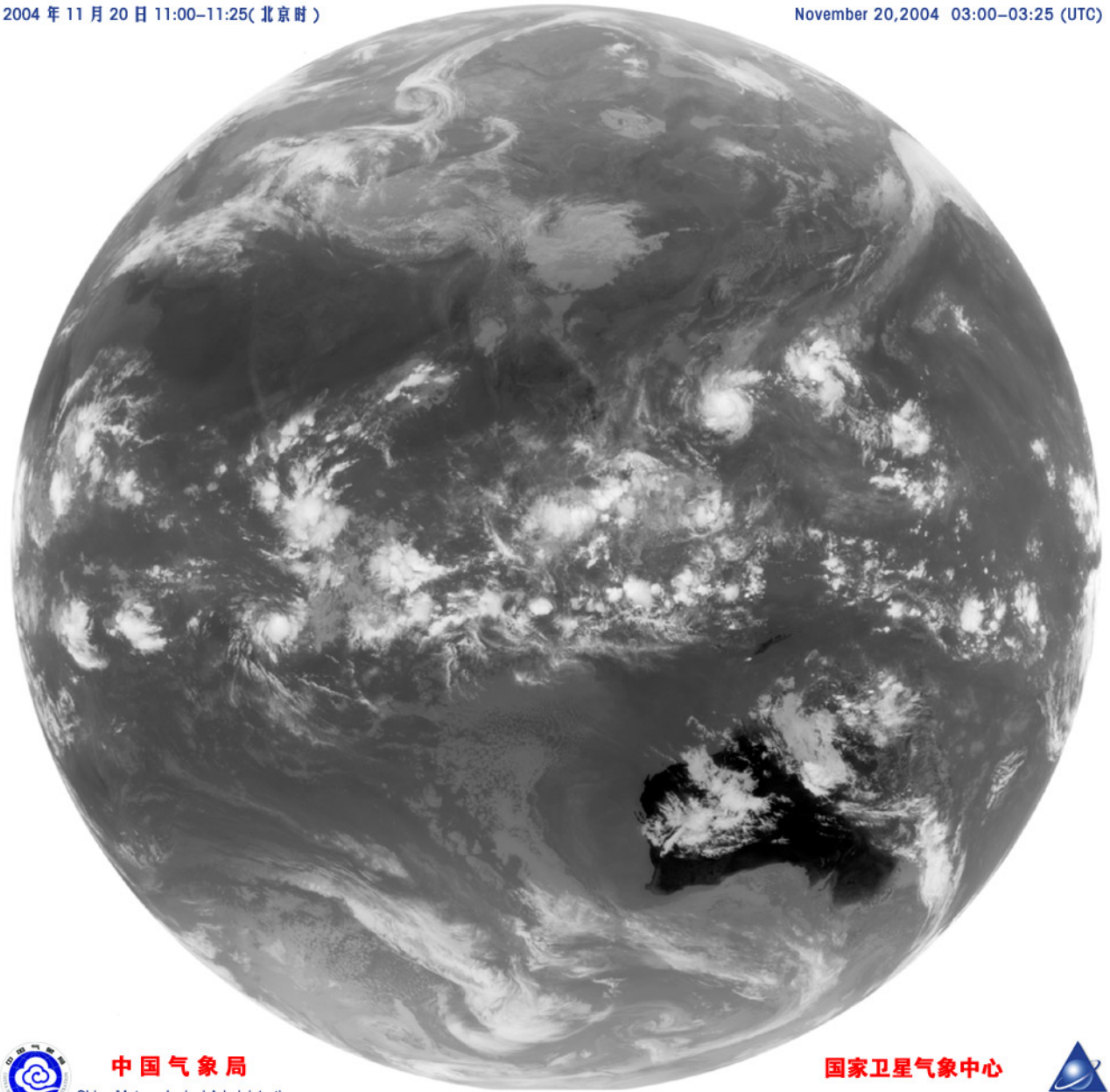
Channel	Wavelength (μm)
VIS	0.55□0.90
IR1	10.3□11.3
IR2	11.5 □ 12.5
IR3	6.3□7.6
IR4	3.5 □4.0


FY-2C 可见光图像 （0.55-0.9μm）
2004 年 11 月 20 日 11:00-11:25(北京时)
November 20,2004 03:00-03:25 (UTC)
中国气象局
China Meteorological Administration
国家卫星气象中心
National Satellite Meteorological Center
NSMC

FY-2C 长波红外图像 （10.3-11.3 μm）

2004 年 11 月 20 日 11:00-11:25(北京时)

November 20,2004 03:00-03:25 (UTC)



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National Satellite Meteorological Center
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FY-2C 长波红外分裂窗图像 （11.5-12.5 μm）

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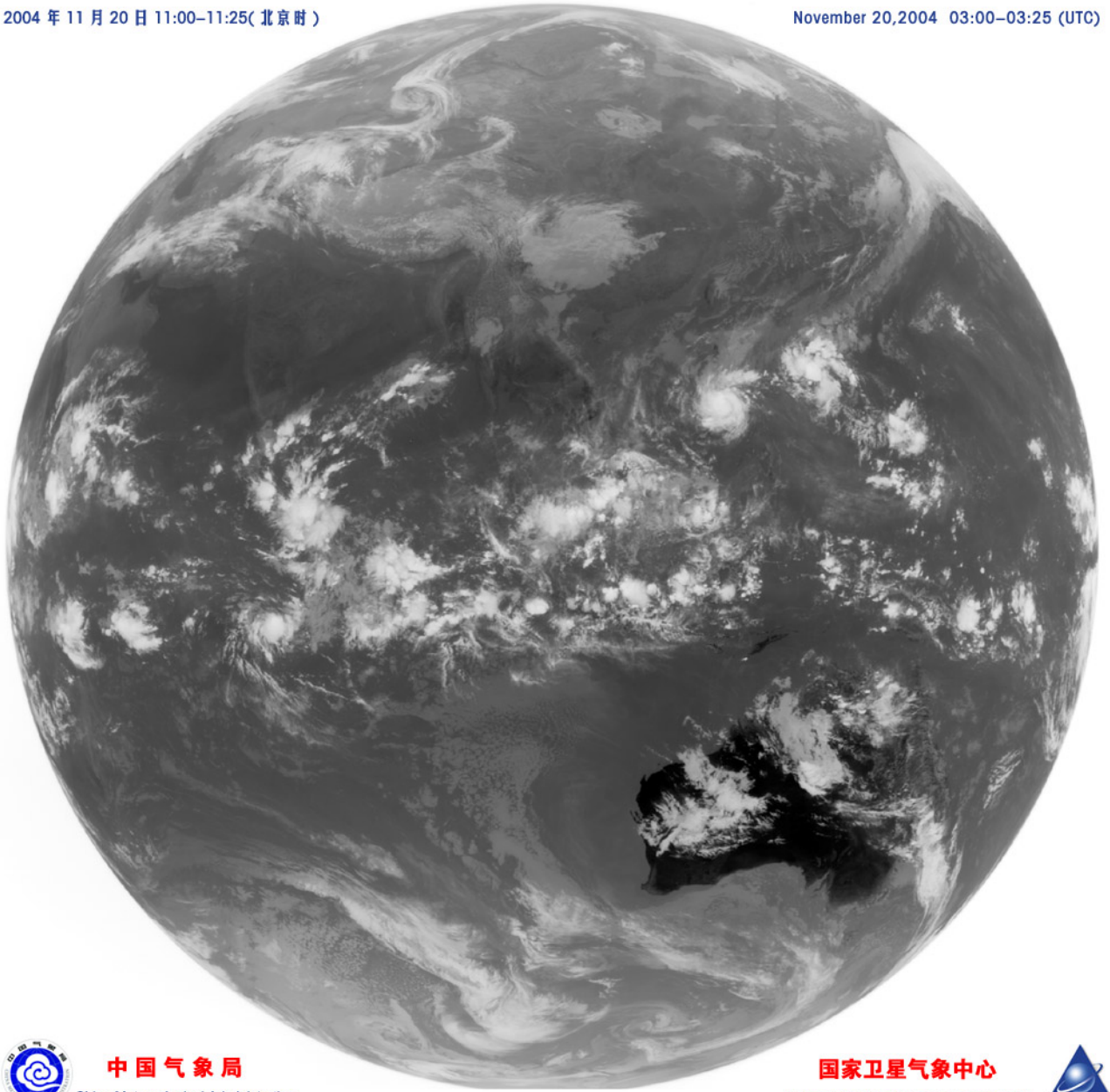
November 20,2004 03:00–03:25 (UTC)



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FY-2C 水汽图像 （6.3-7.6 μm）

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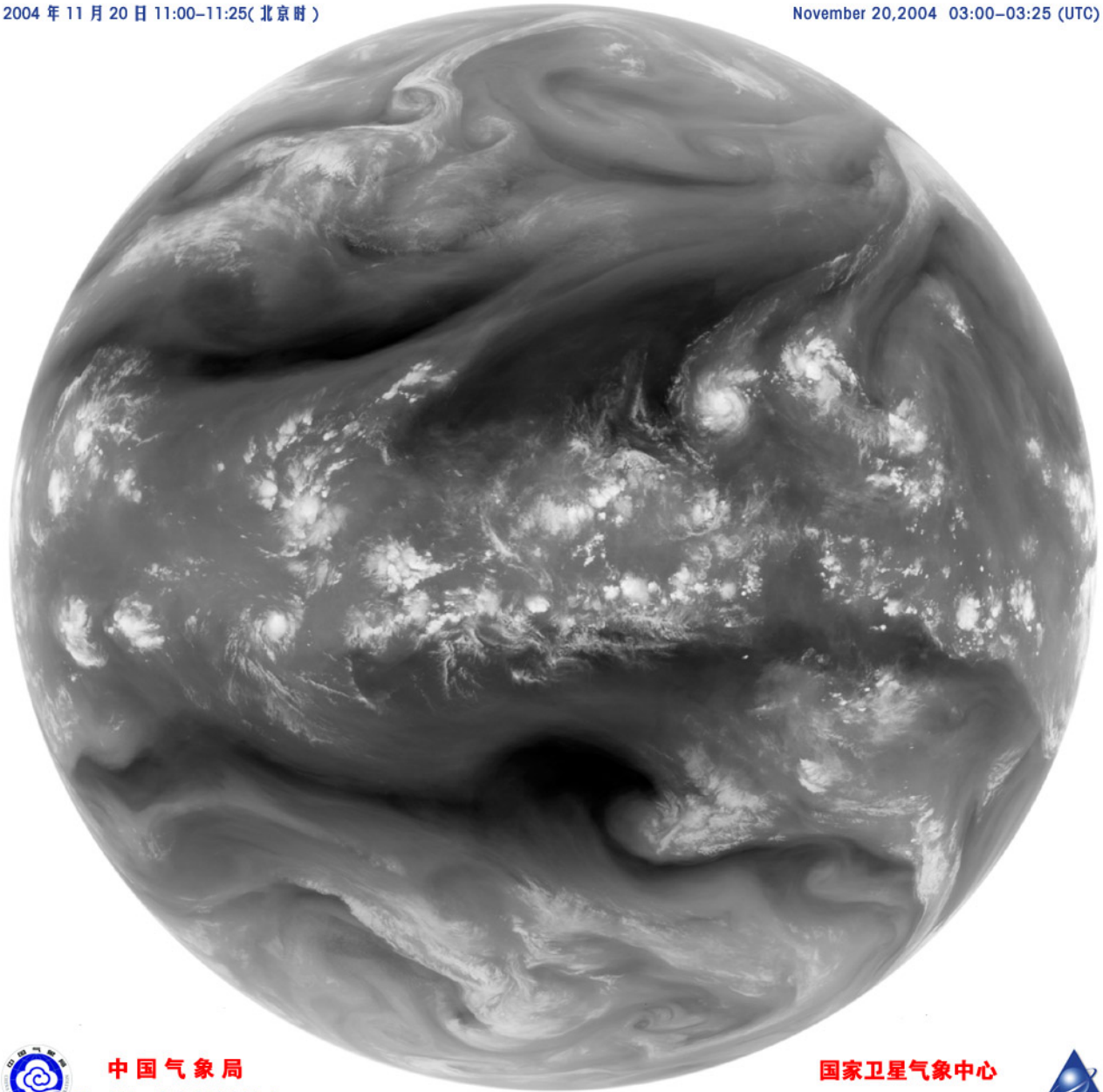

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FY-2C 中波红外图像 （3.5-4.0 μm）

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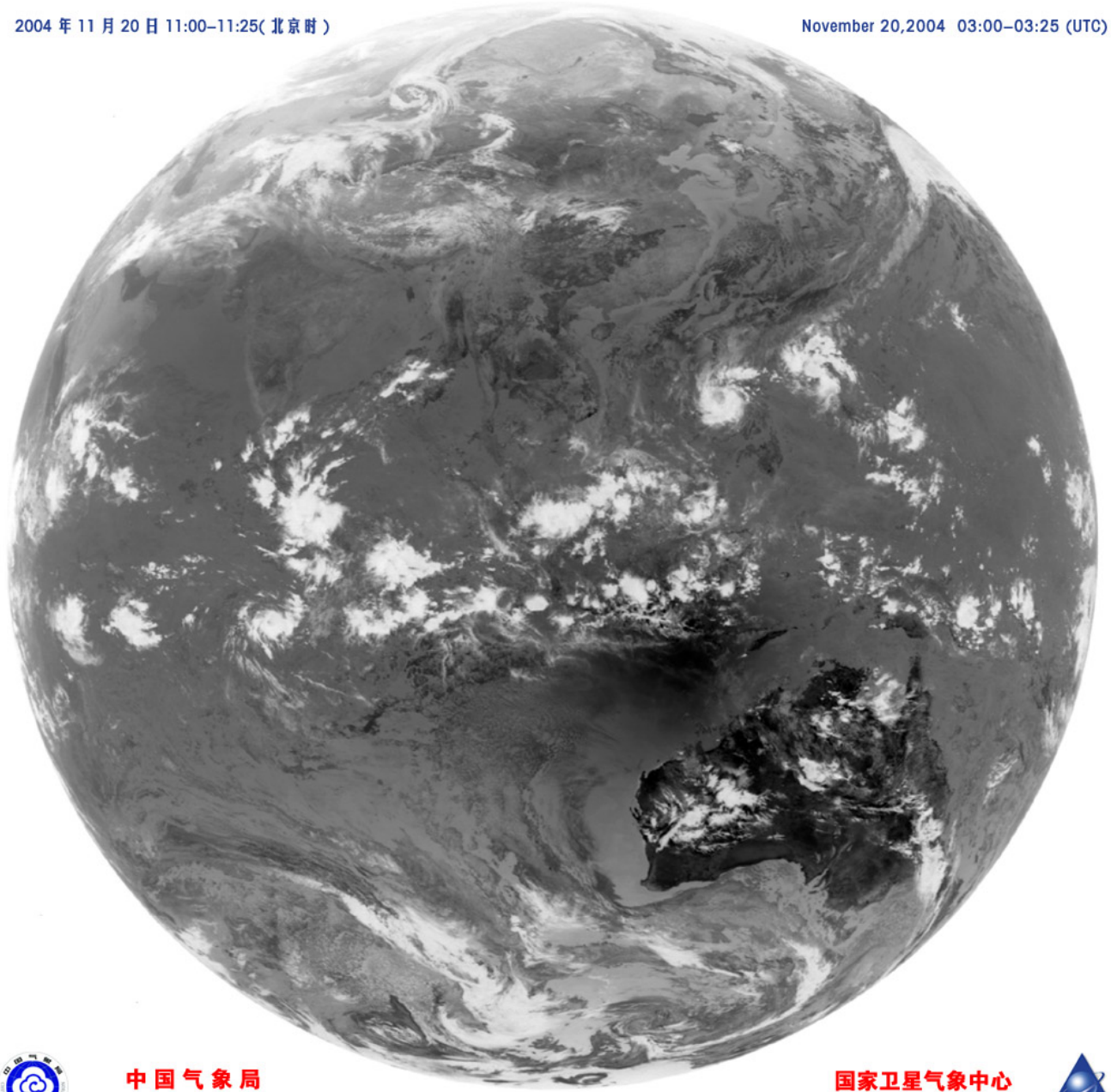
November 20,2004 03:00-03:25 (UTC)



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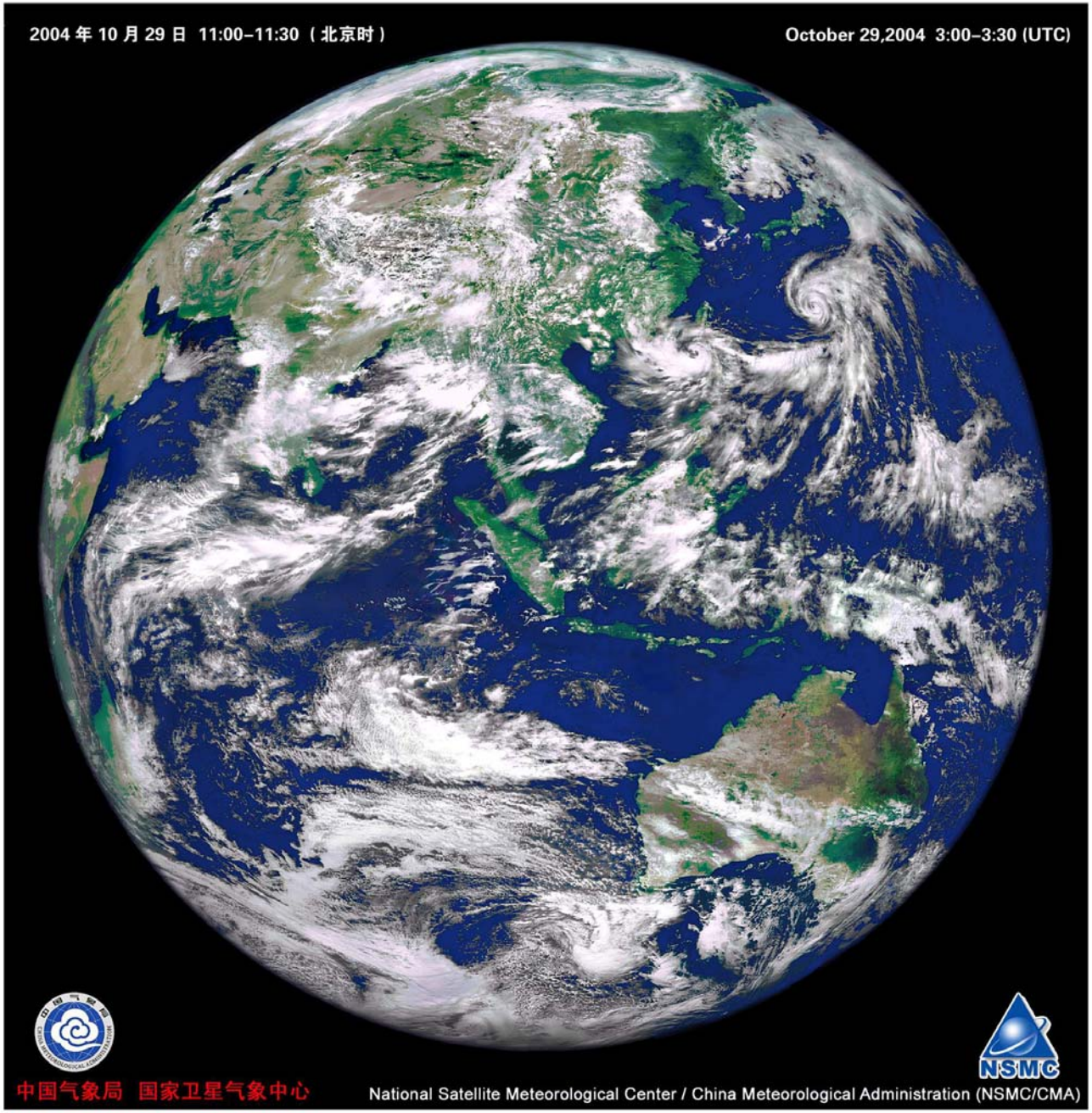
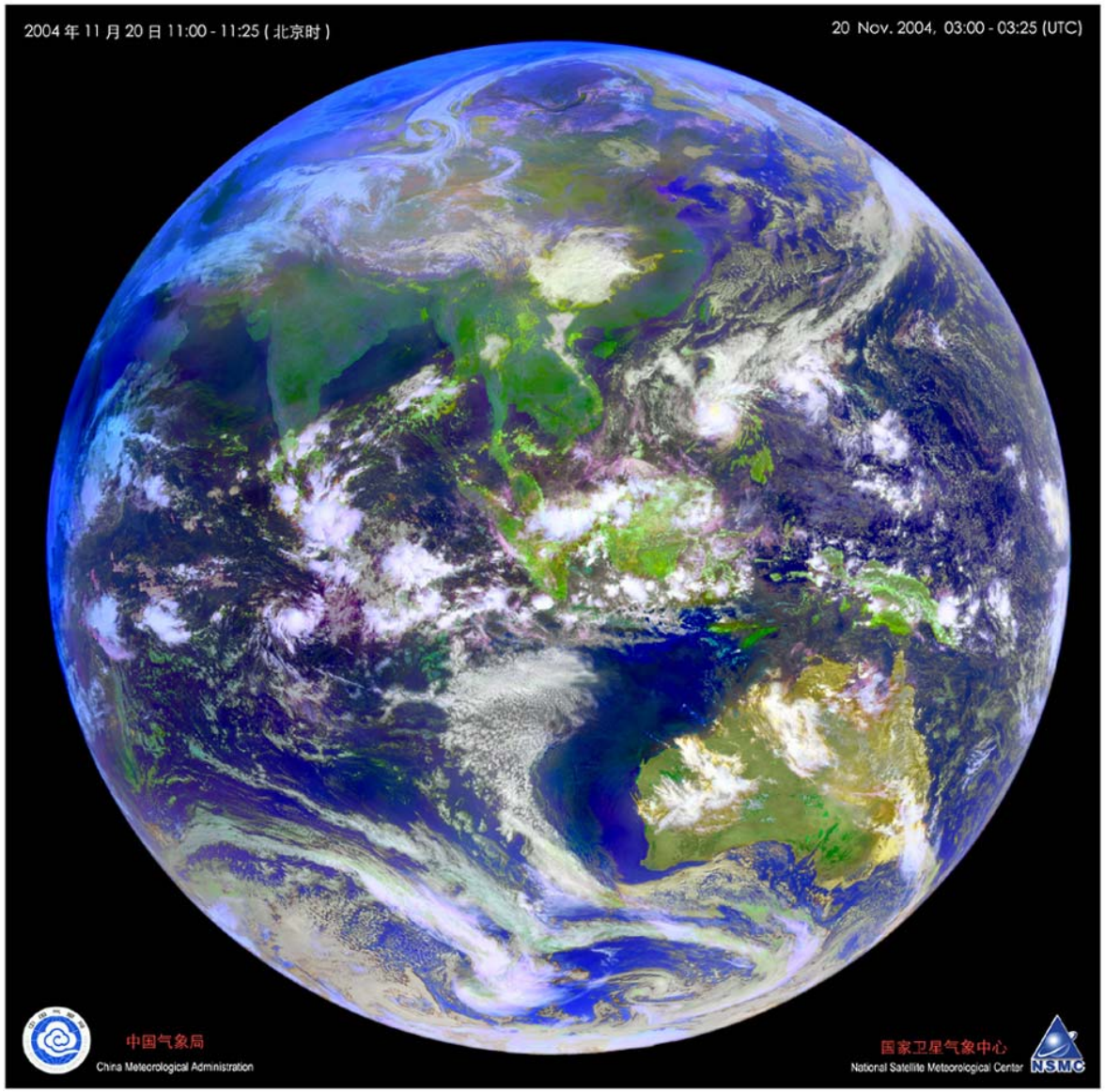
风云二号C星第一幅可见光图像

FIRST VIS IMAGE OF FY-2C



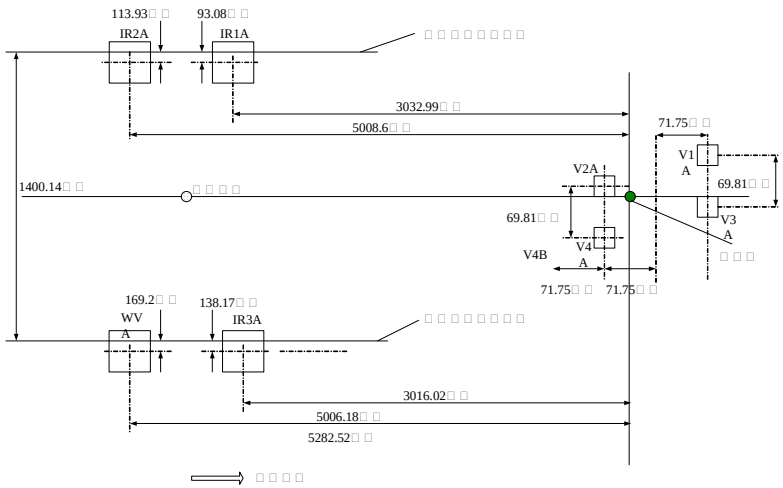
风云二号 C 星第一幅彩色合成图像

THE FIRST COLOR COMPOSITE IMAGE OF FY-2C

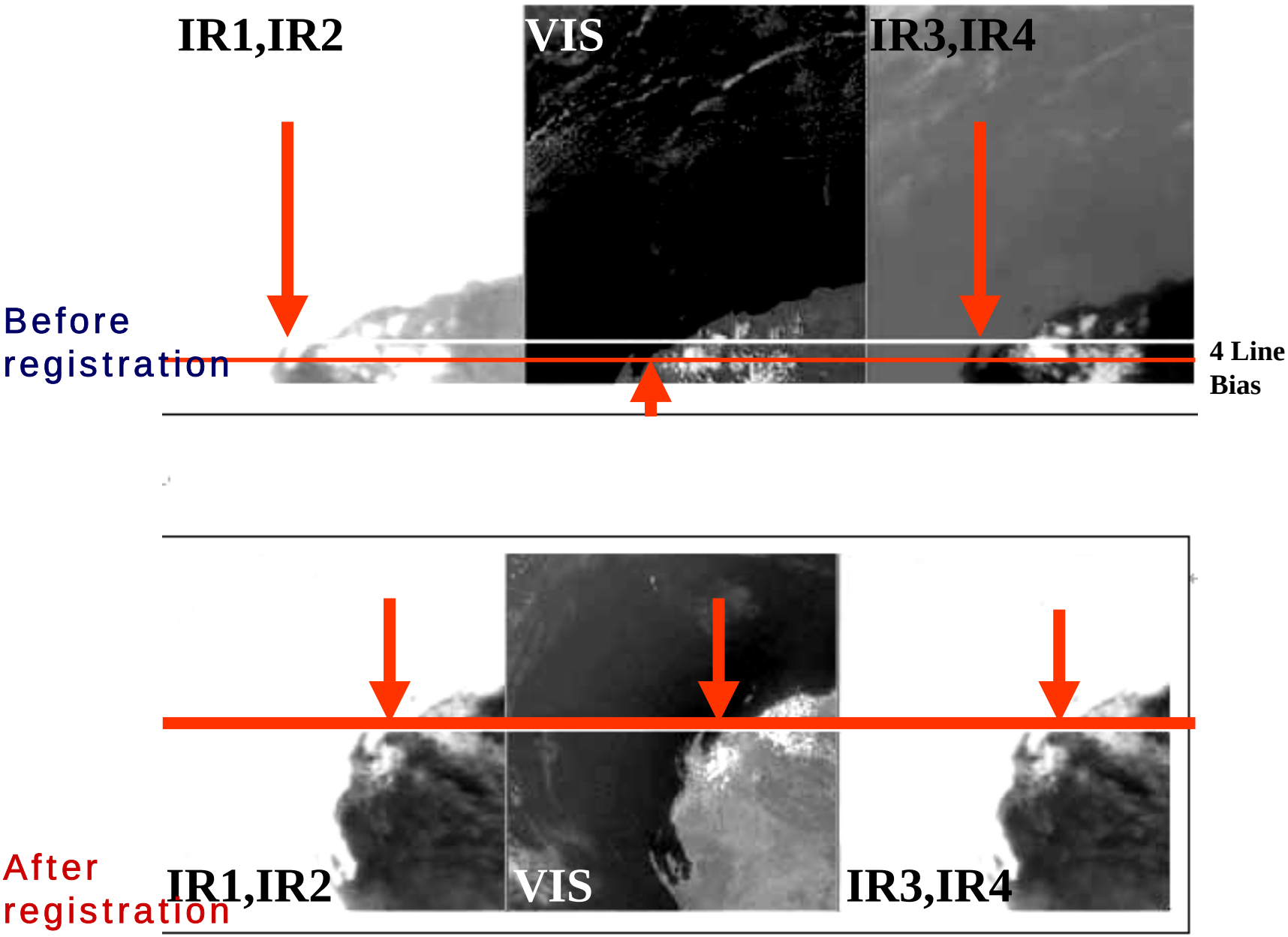


Status on Image Registration Navigation and Calibration

Image Registration



- For FY2C Satellite, multi channel observation is such realized:
- Sensors of different channels are located at difference places of the focus plane. Filters are put on the sensor in low temperature condition. By such way, better S/N ratio is gain.
- Image registration is performed at ground.


IR1,IR2
VIS
IR3,IR4
Before registration
4 Line Bias
After registration
in line direction
IR1,IR2
VIS
IR3,IR4

Registration in Column Direction

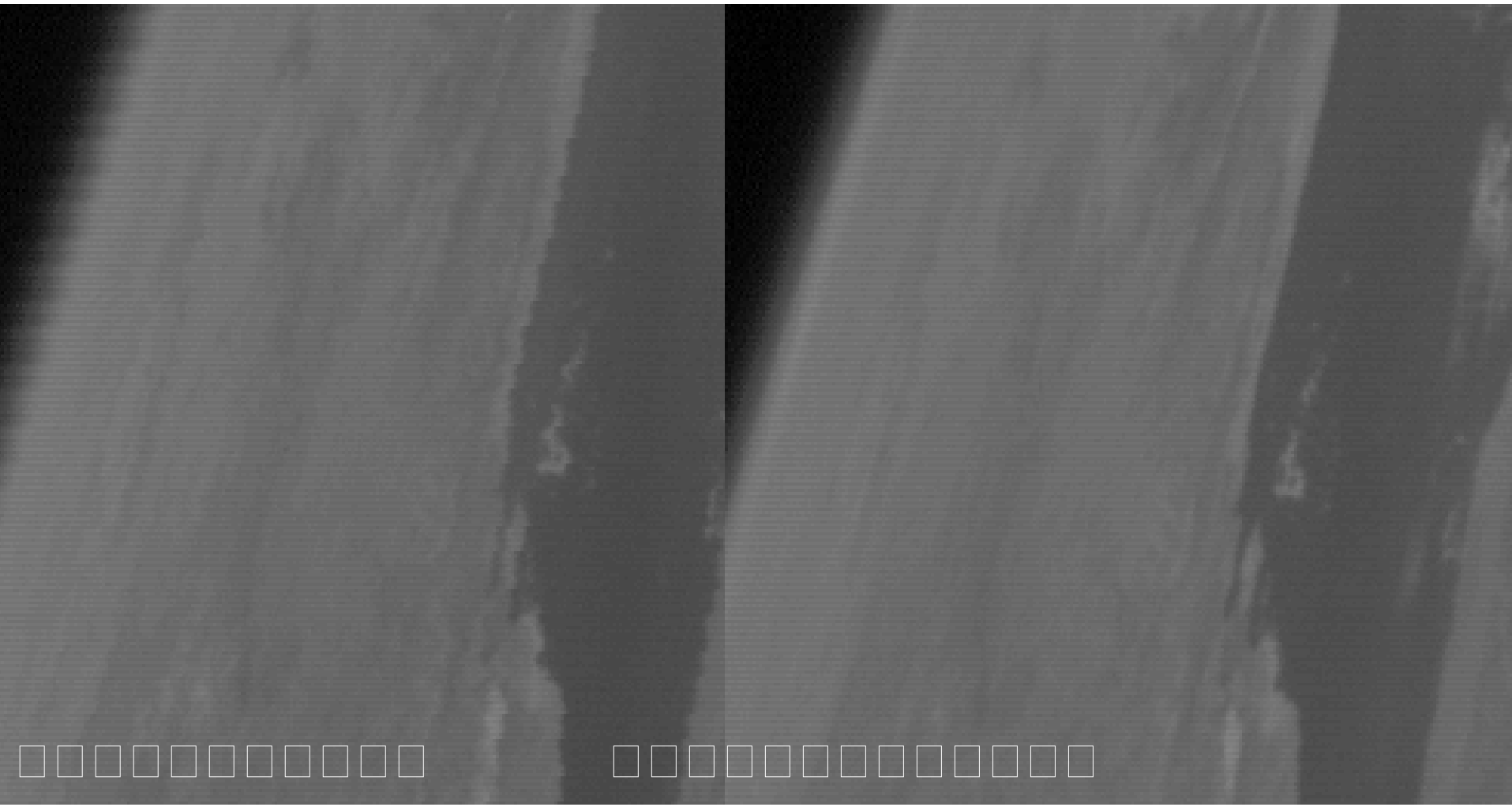
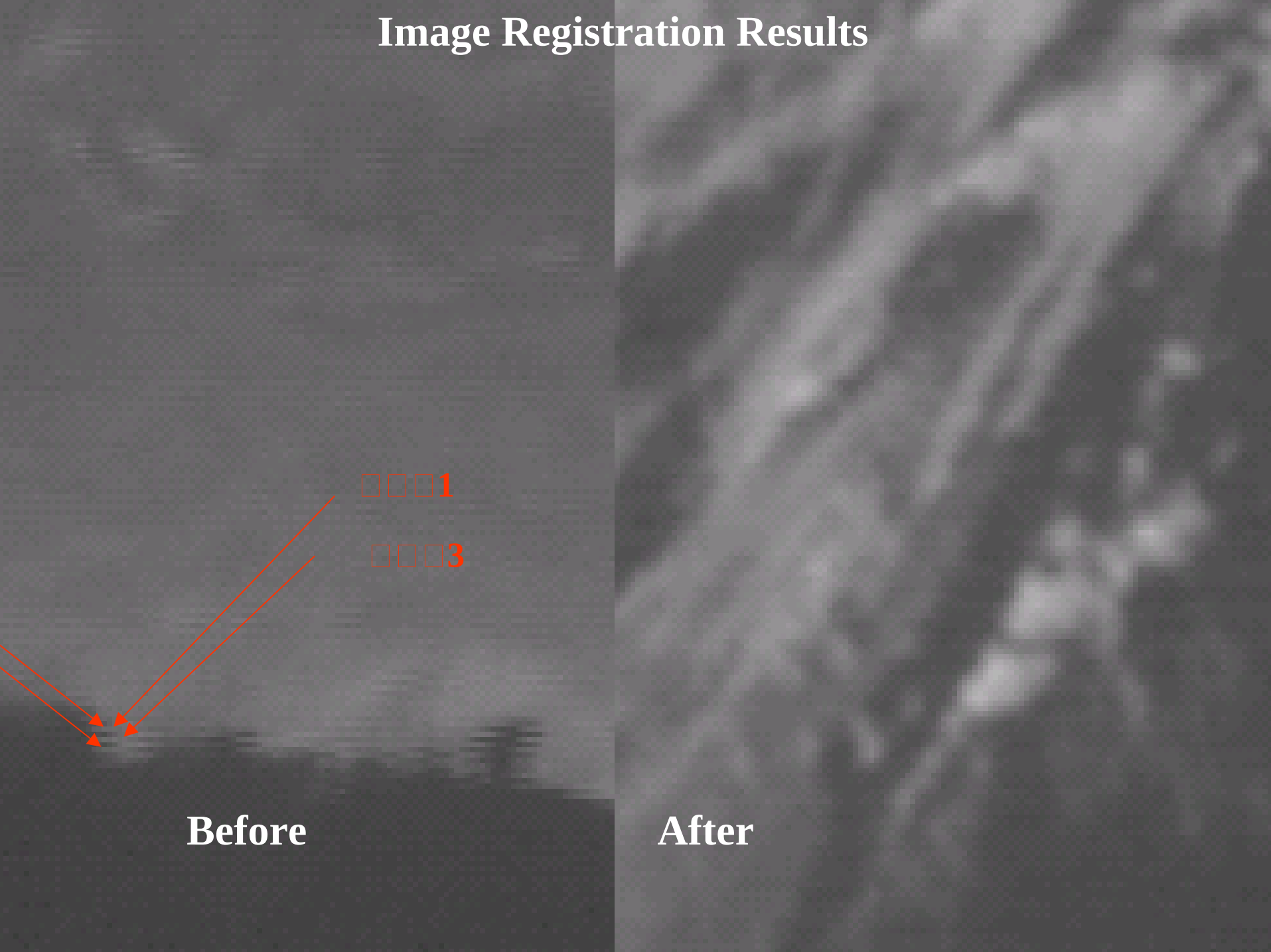
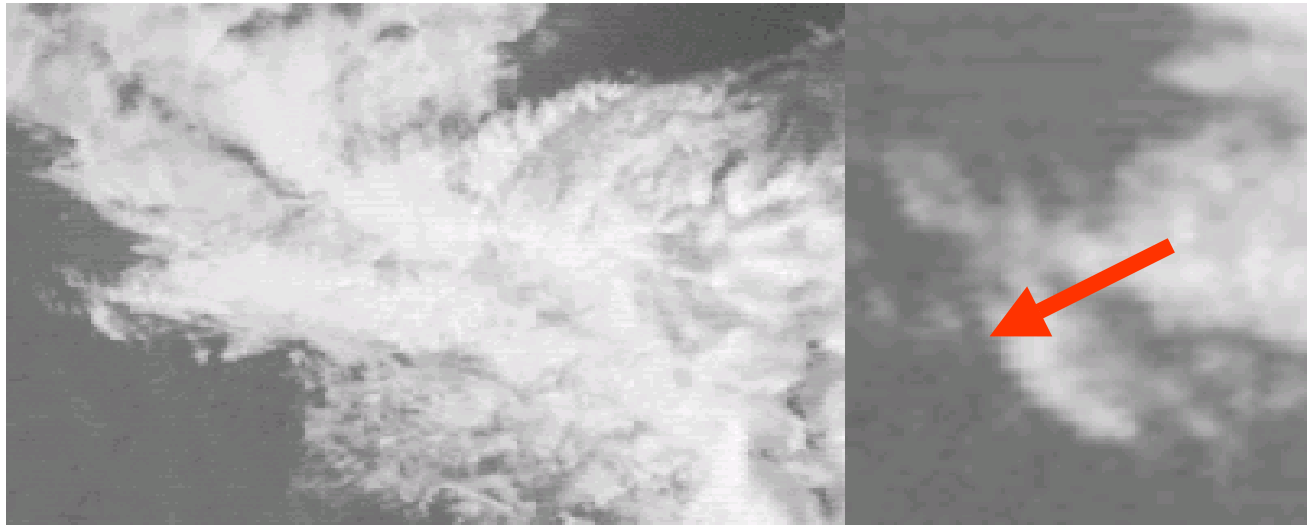
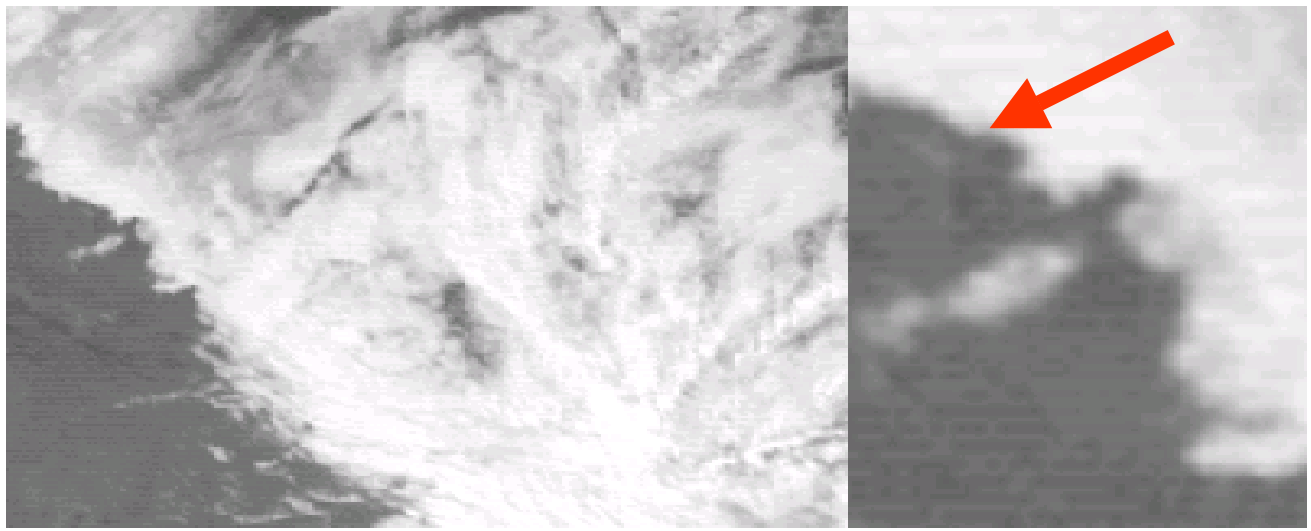


Image Registration Results





Before Image Registration

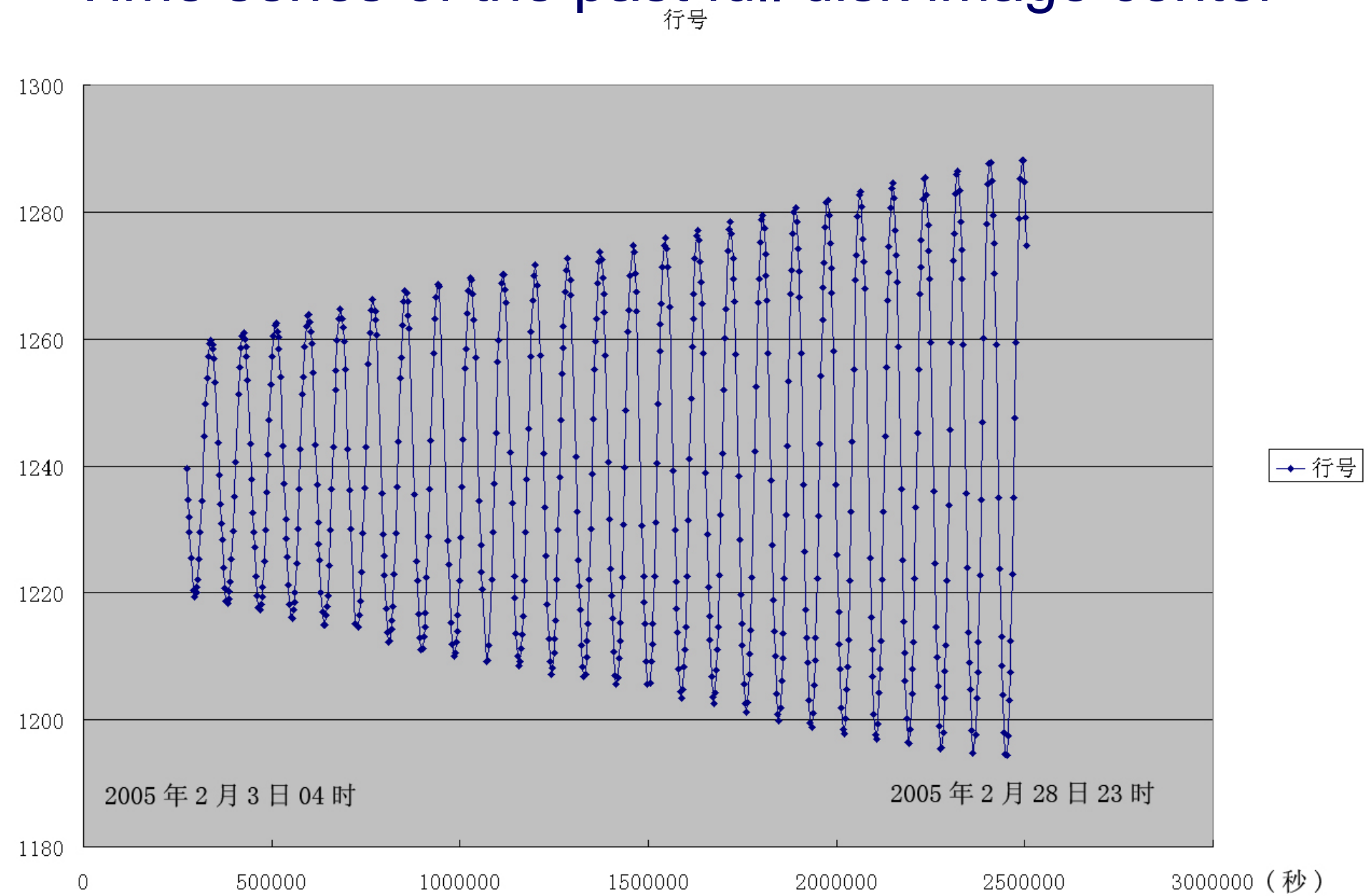


After Image Registration

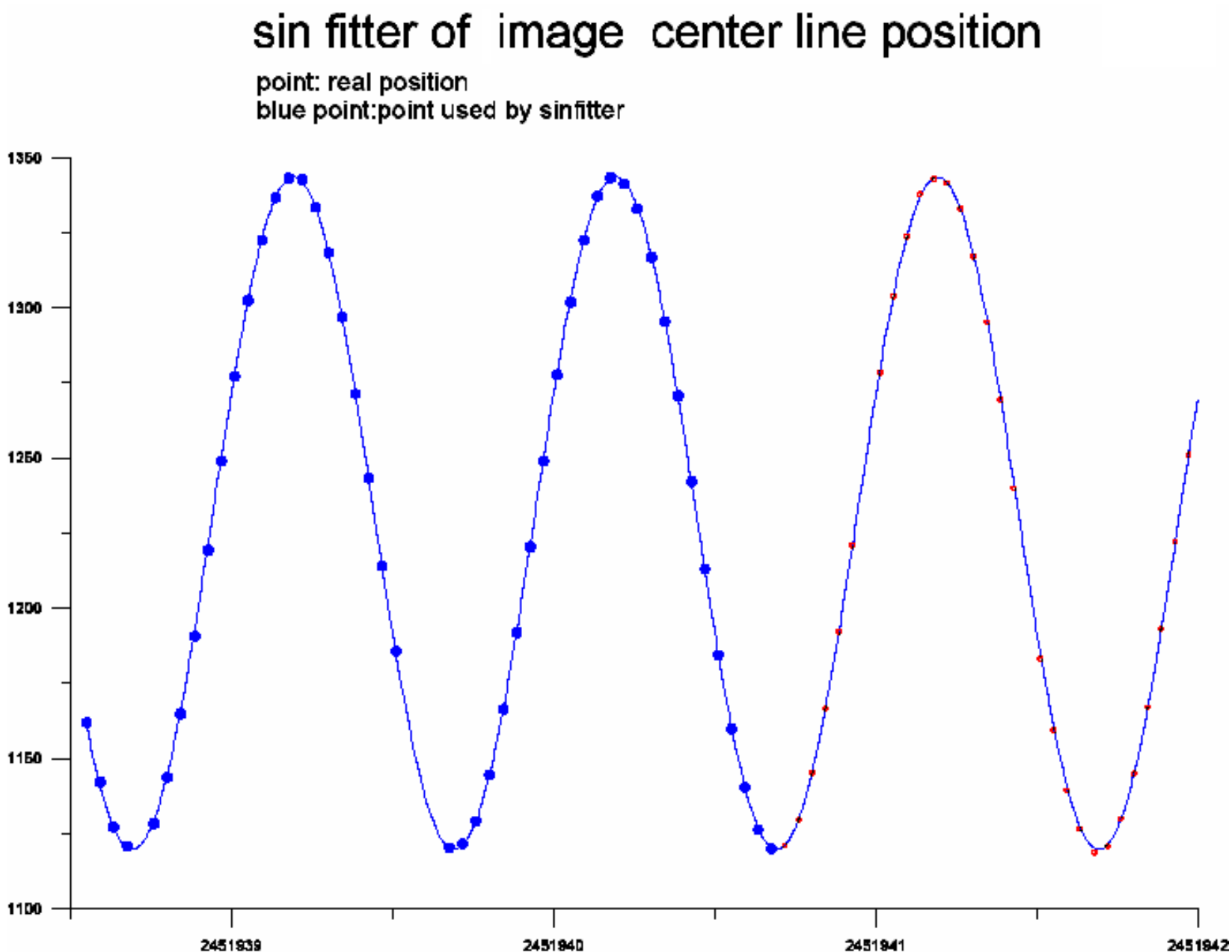
Image Navigation

- FY2C image navigation grid is gained by the solution of a mathematical model.
- Time series of the past full disk image center and the satellite position are known data for the model.
- 13 parameters for image navigation are gained. 12 of them can be treated as constant in 24 hours.
- All navigation process is done automatically. No any land mark registration or manual operation is performed.
- Except 1or 2 days after orbital and attitude control, the accuracy of prediction grid is IR pixel level.

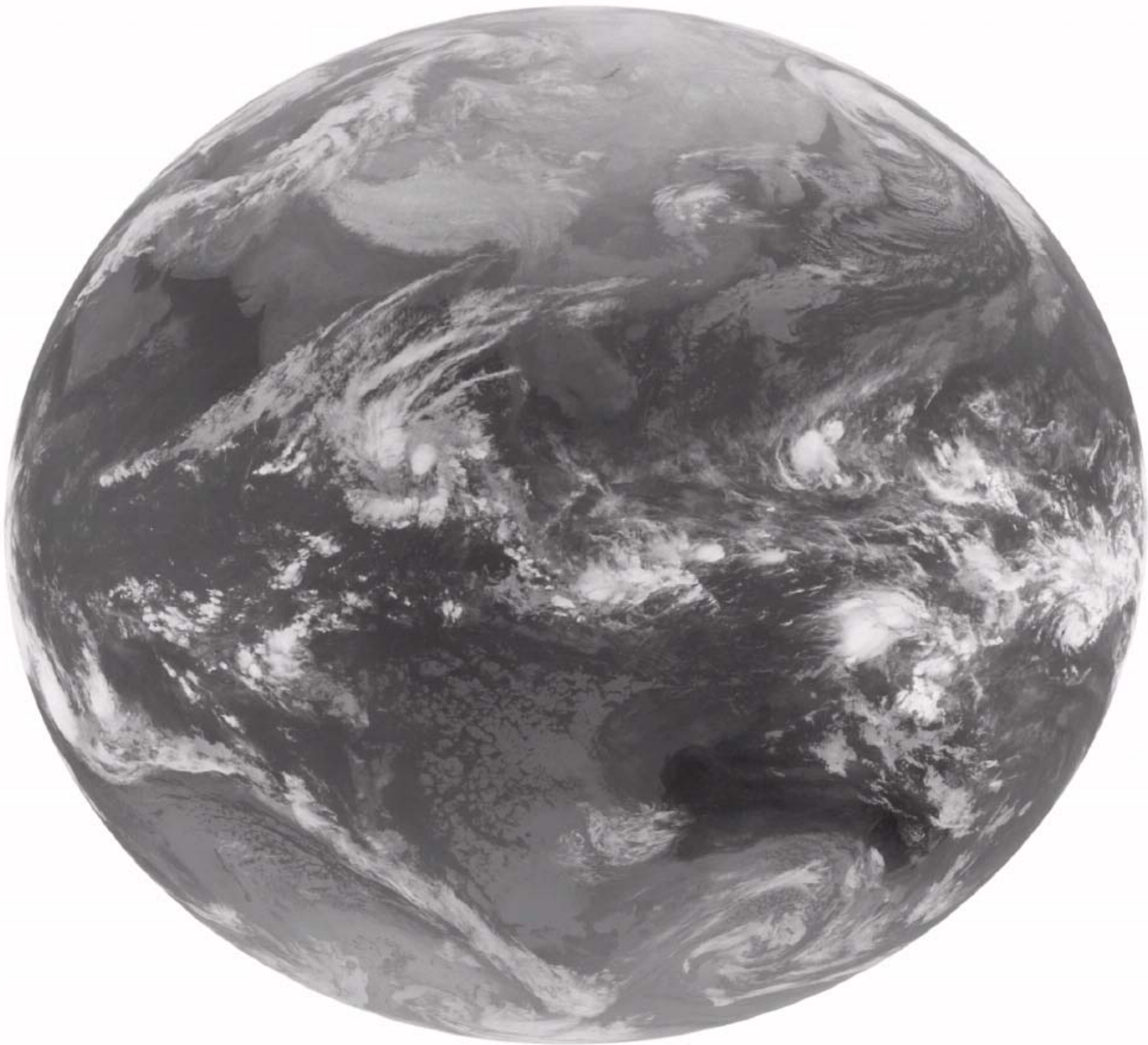
Time series of the past full disk image center



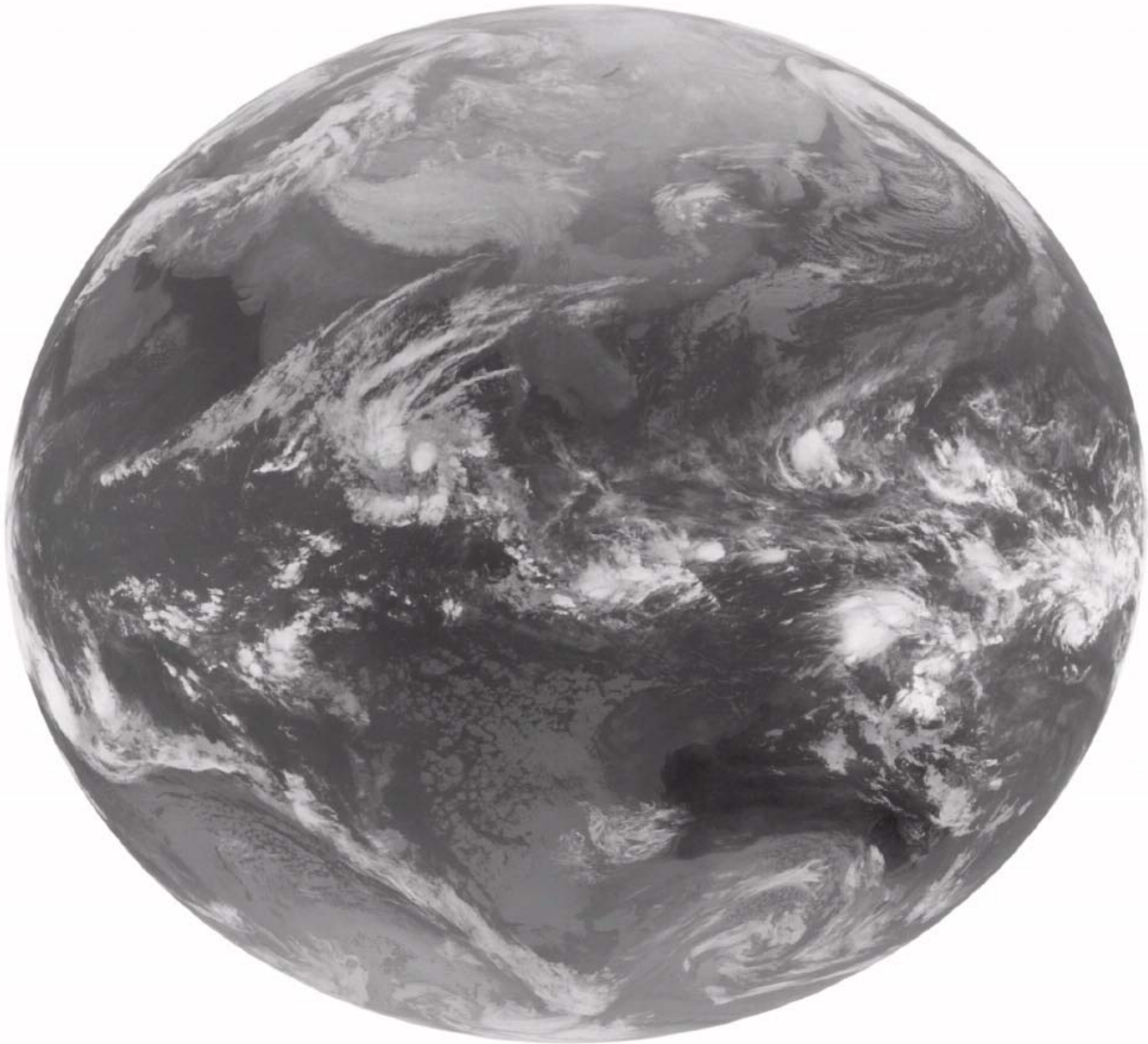
Full disk image center is predictable



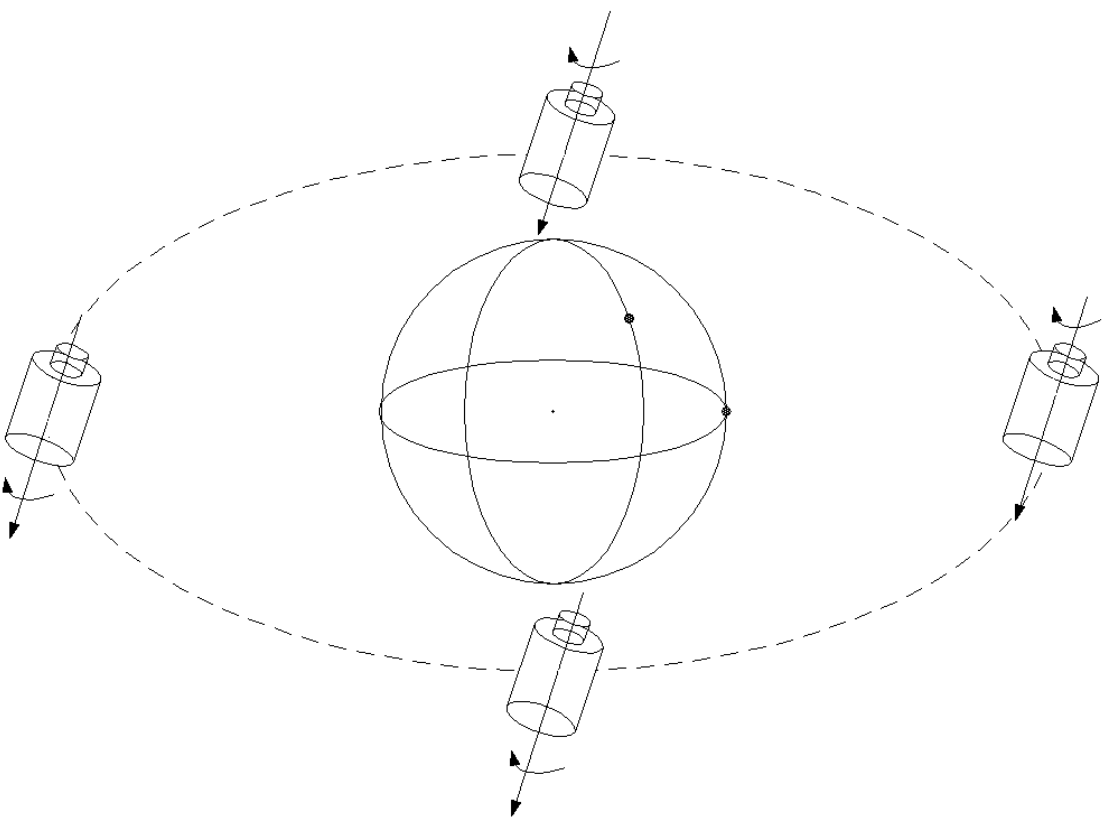
Time series of the past full disk image center, notice the vertical movement of the image

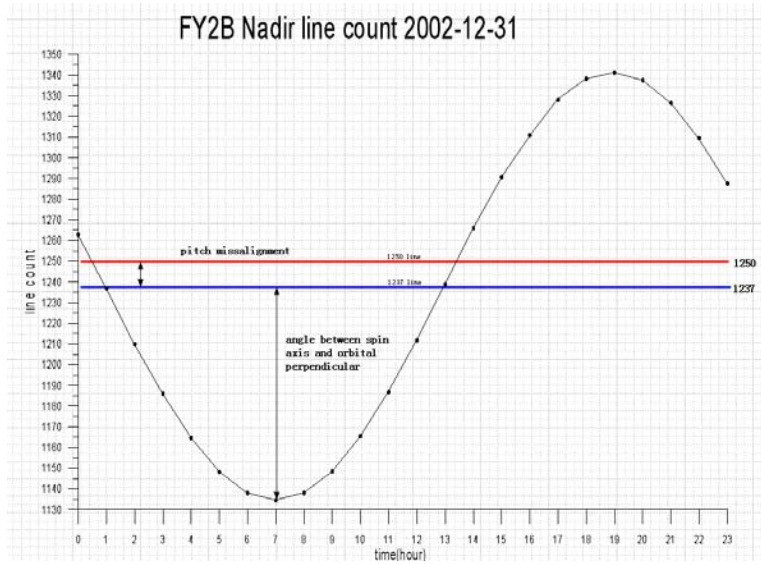


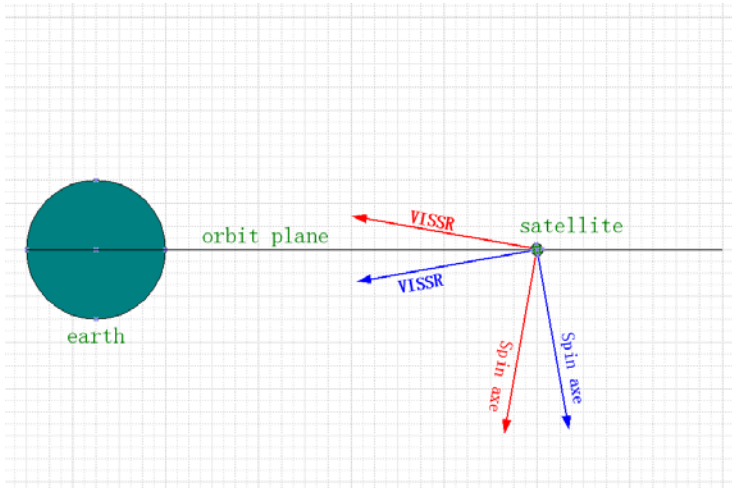
Put Earth center at the origin, there is a tendency of turning motion



Explanation to the phenomena





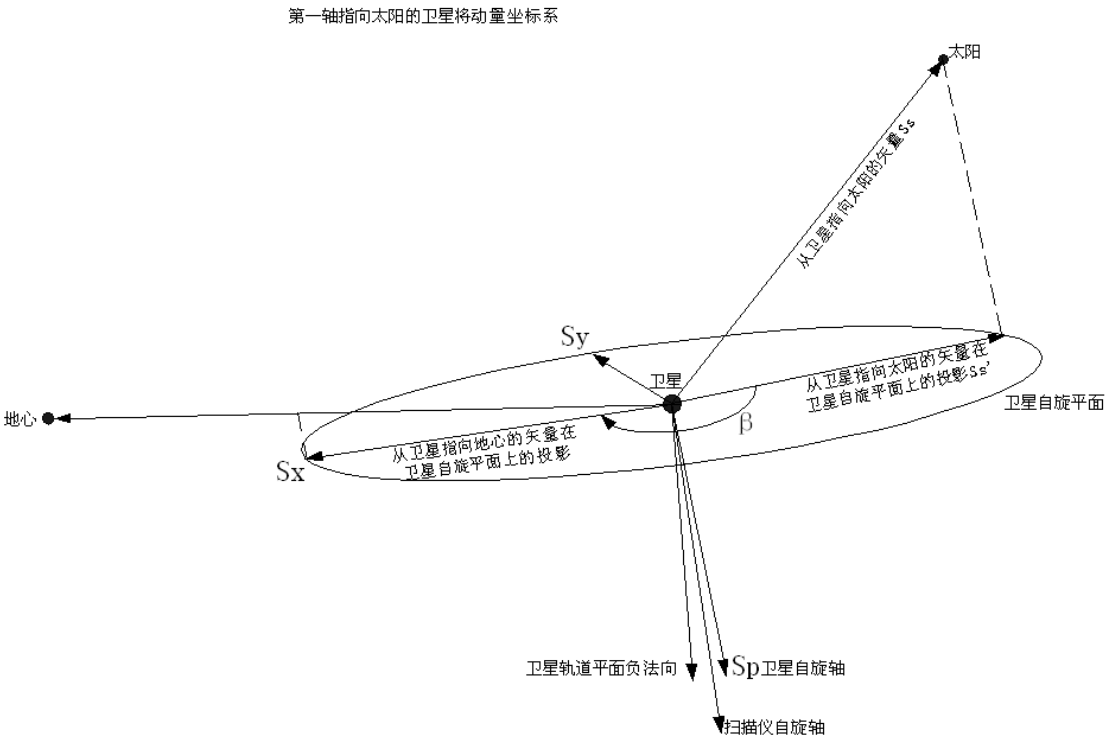


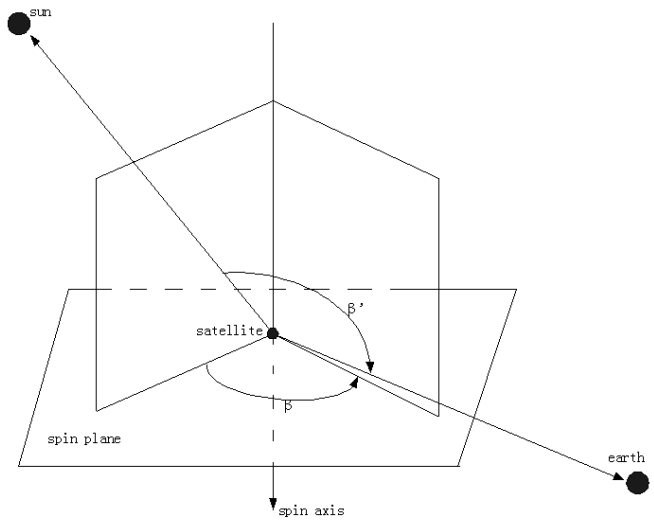
□□□□□,□□□□□□□□□

Mathematical model

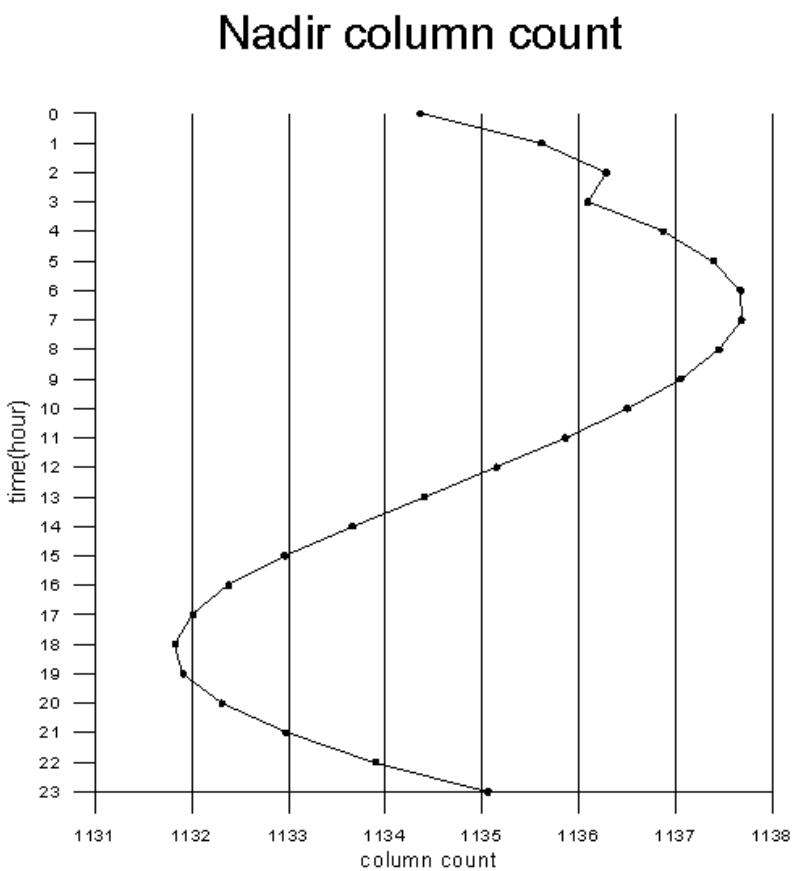
- **SATVIEW.VISSR**=cos(φ+ζ)
- Known **Observation Vector SATVIEW Angle between Earth center and Image center lines φ**
- For **Attitude Vector VISSR Missalignmentζ**

Earth center column position is gain by the angle between the sun and the earth viewing from the satellite



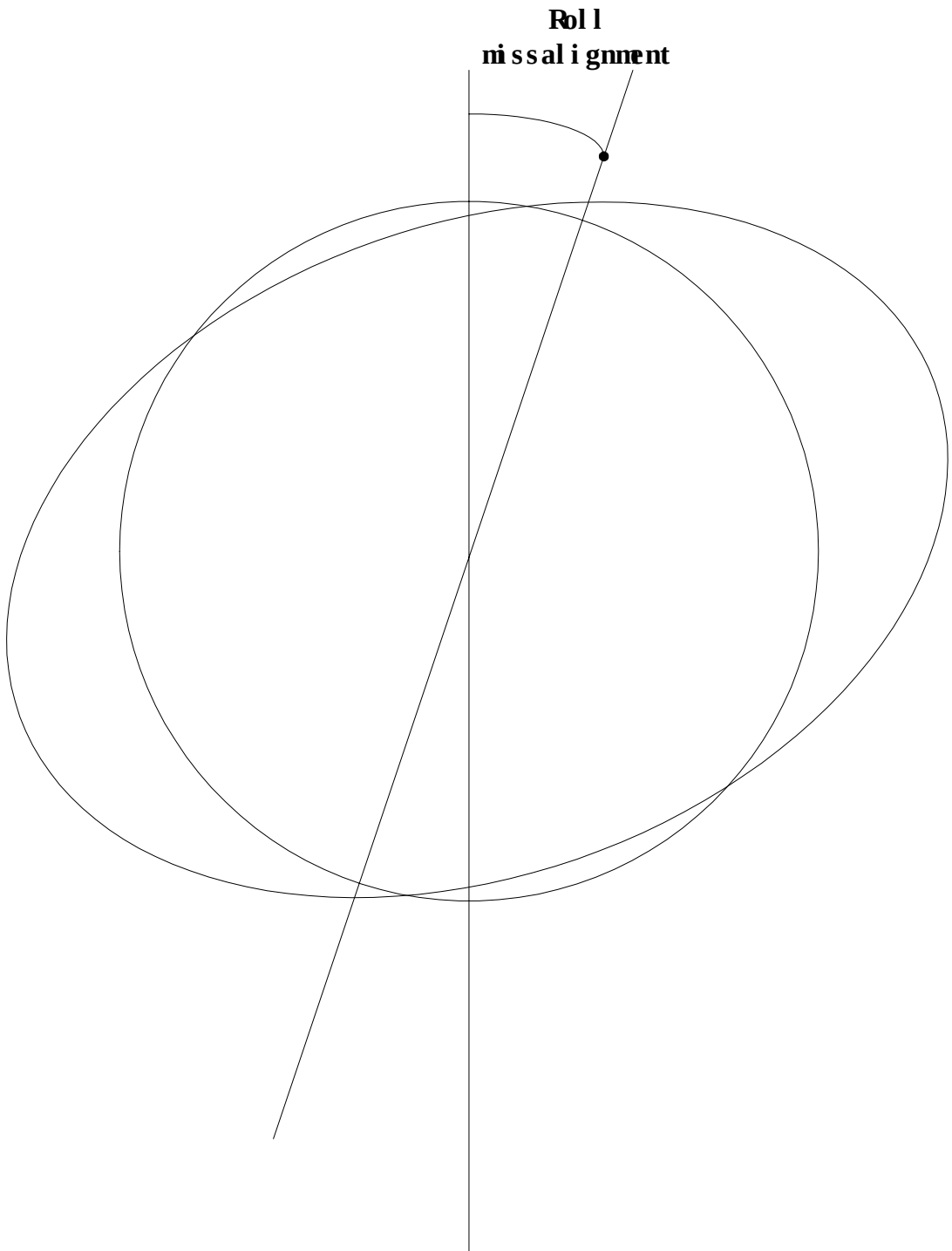


Earth center column position time series consists of a beautiful sine wave again



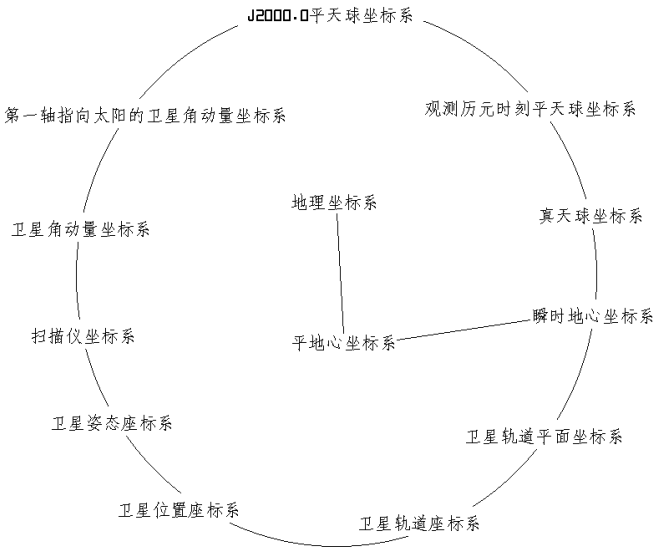
The residual is minimal but measurable by the third component of misalignment

GOES did not define this parameter



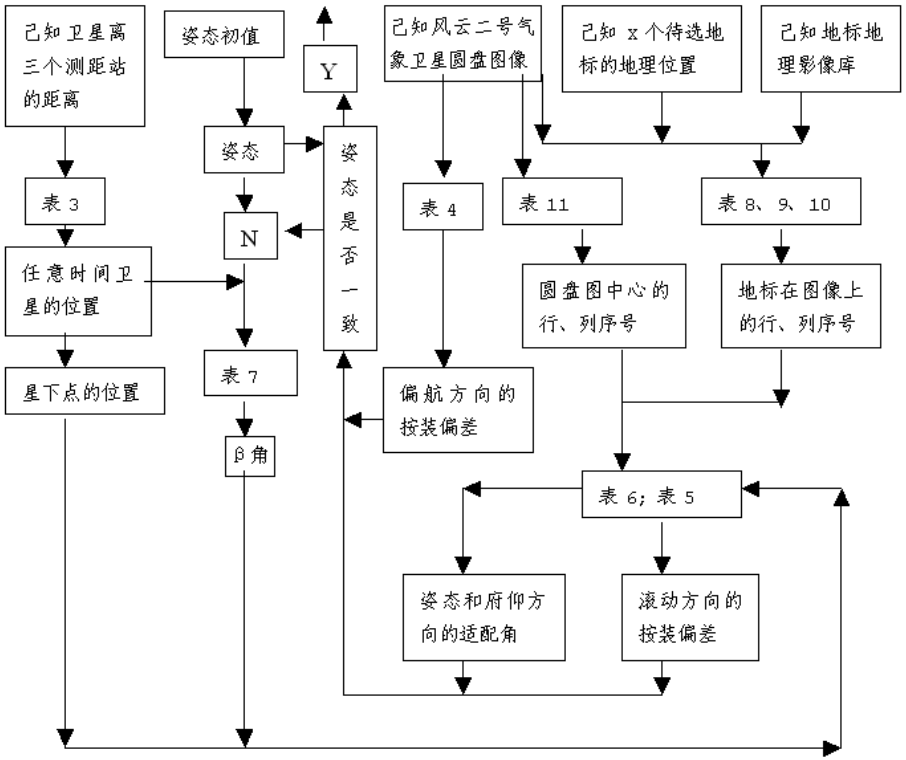
The key of the solution is coordinate transition

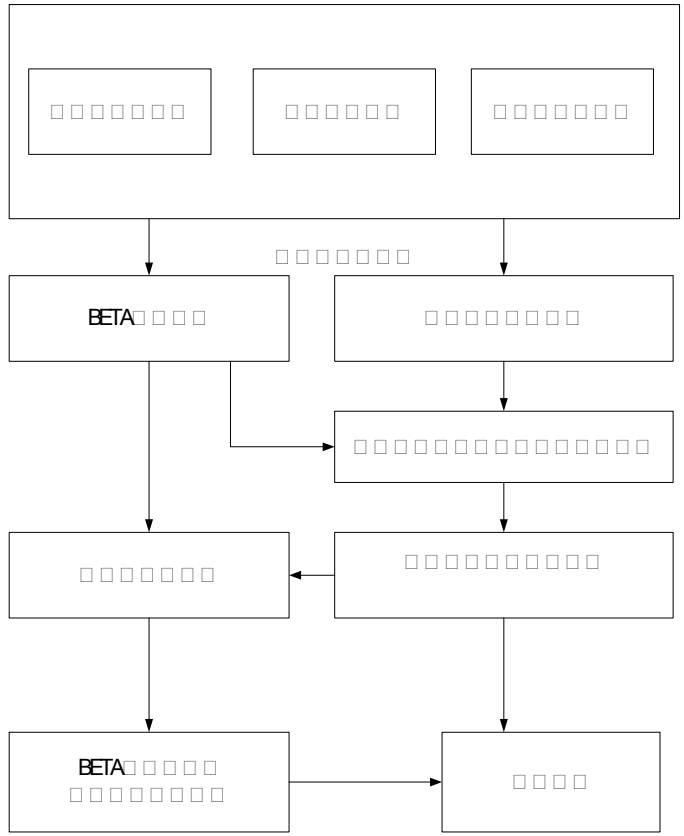
coordinate transition



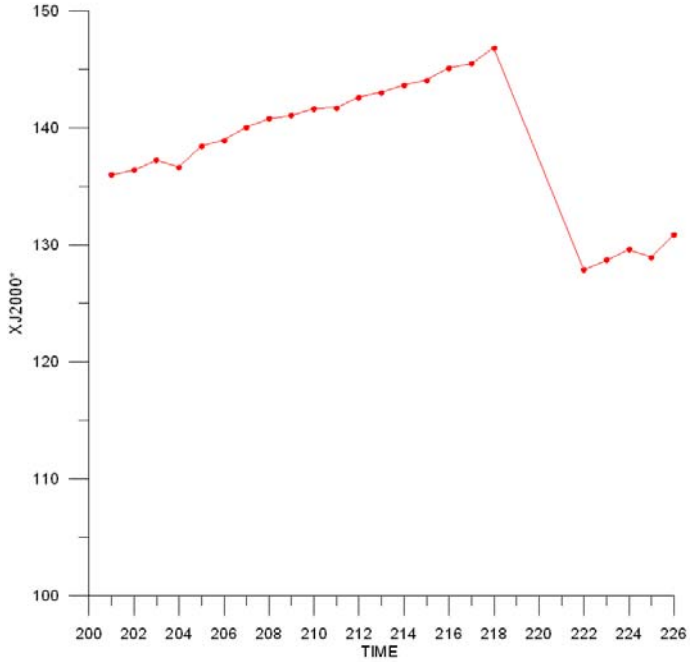
$$\begin{pmatrix} Y_1 \\ Y_2 \\ Y_3 \end{pmatrix} = \begin{pmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{pmatrix} \cdot \begin{pmatrix} X_1 \\ X_2 \\ X_3 \end{pmatrix} + \begin{pmatrix} B_1 \\ B_2 \\ B_3 \end{pmatrix}$$

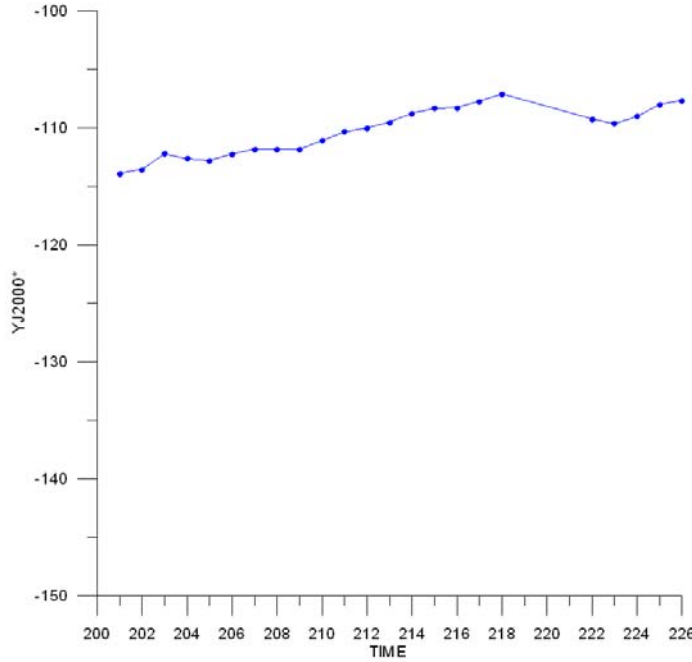
FY2C navigation equation solution process (Total automatic)

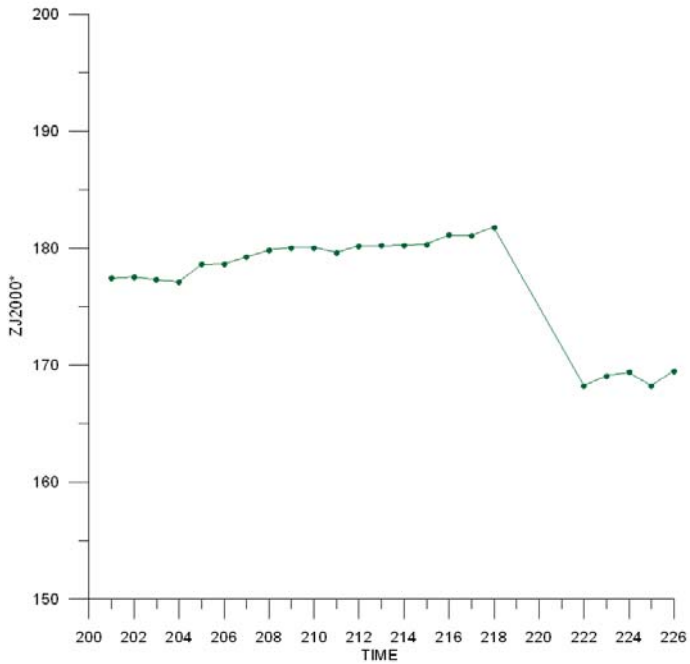


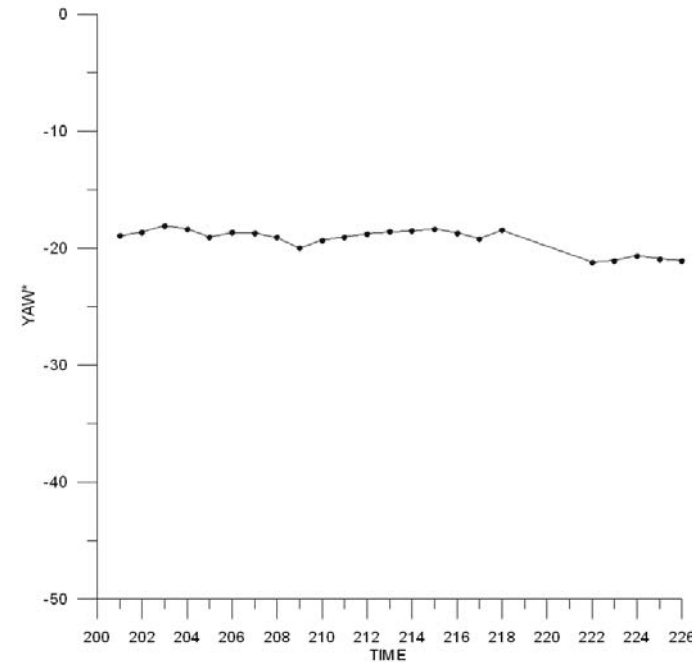


Solution



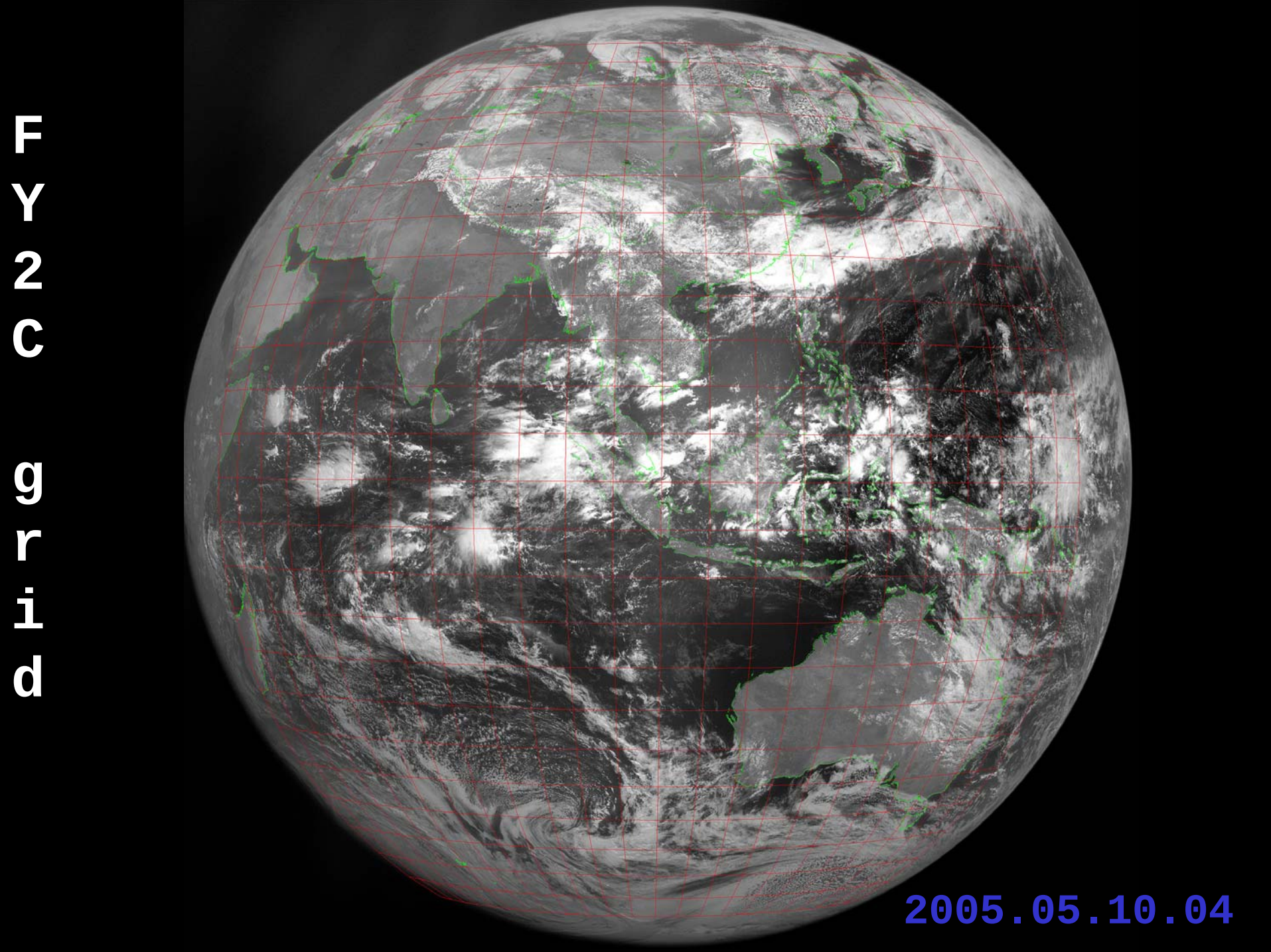




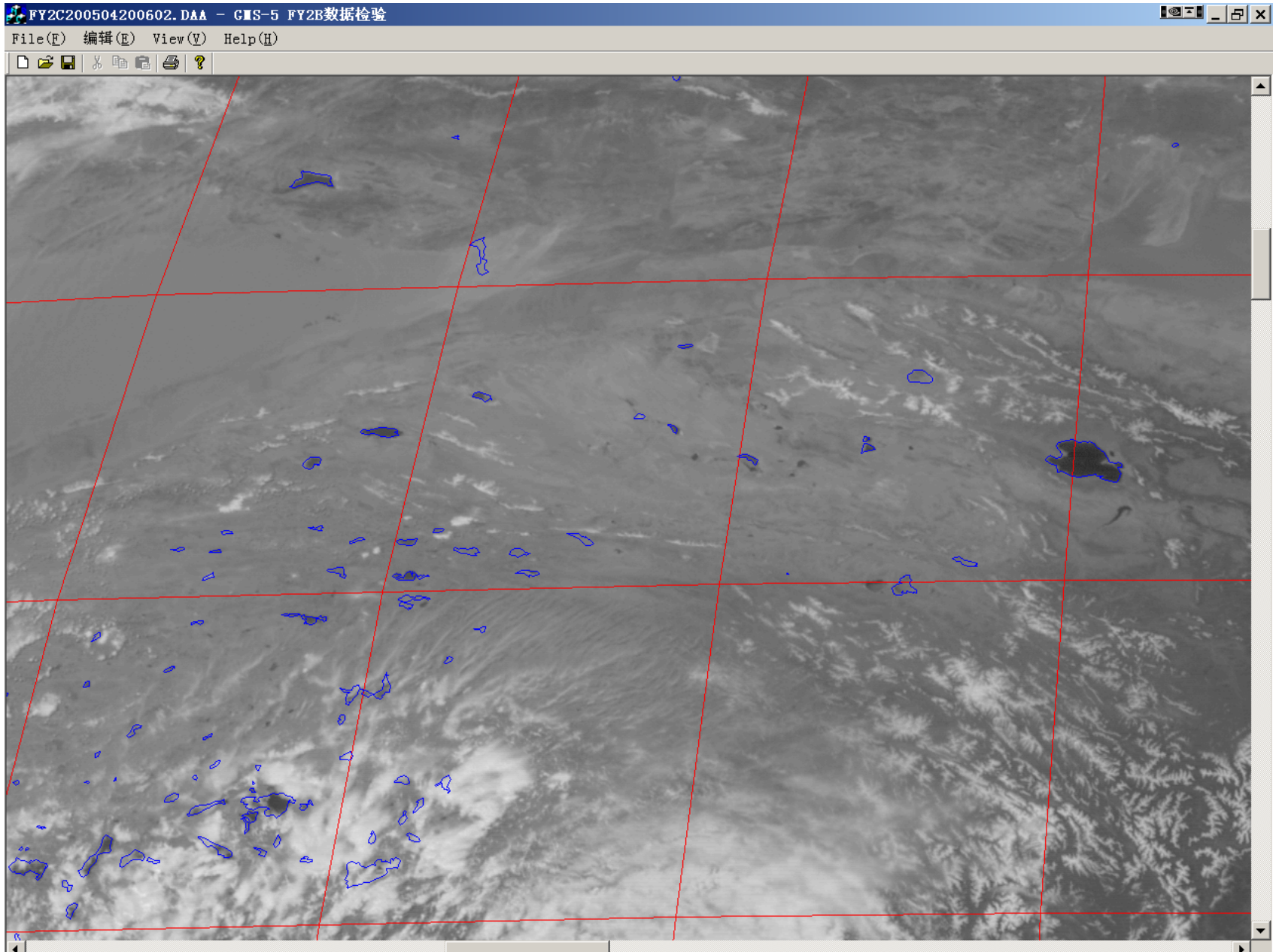


*Y coordinate unit =angle/0.000140

Xu Jianming Lu Feng


FY2C grid
2005.05.10.04

2005.4.20:06



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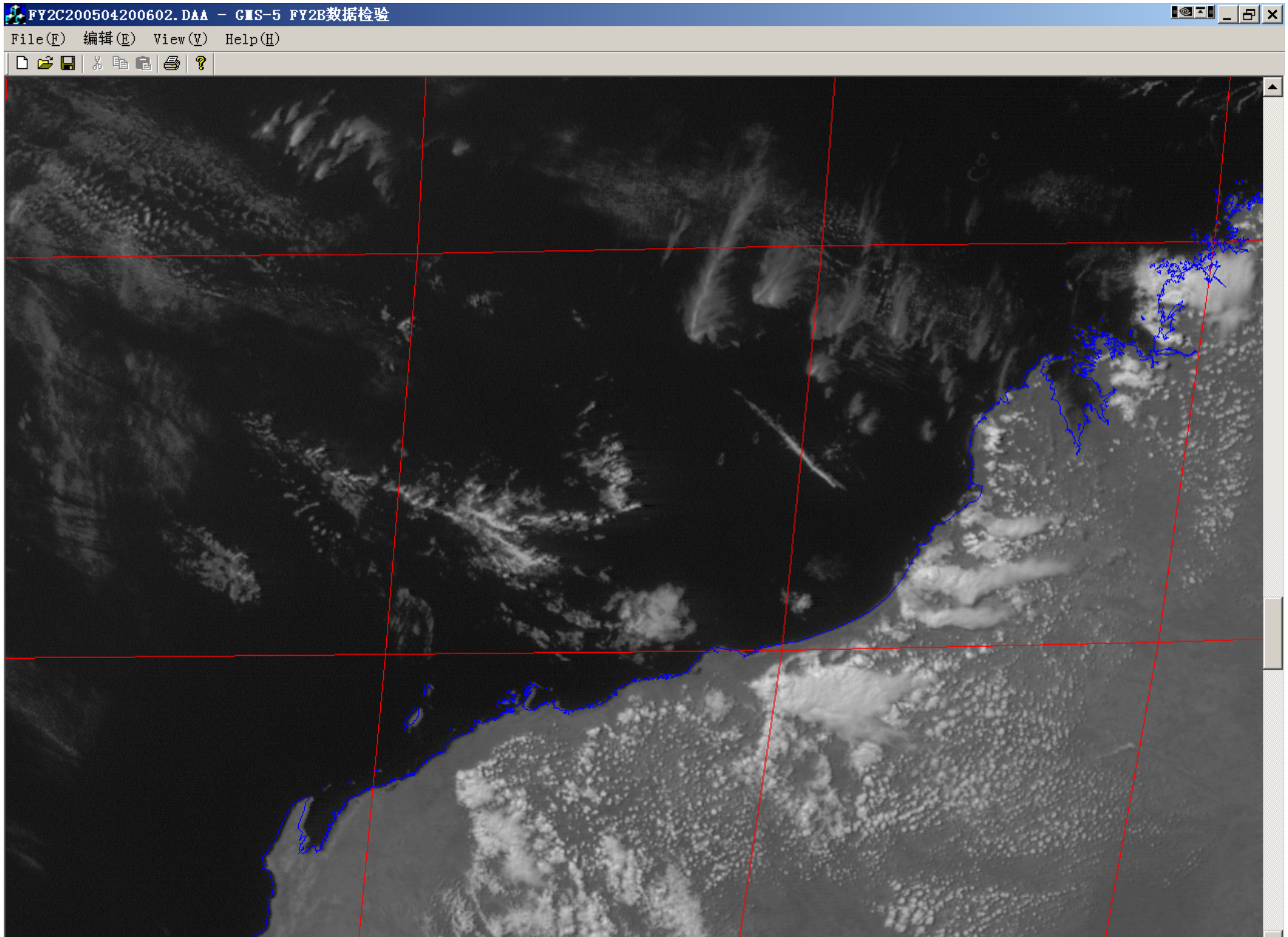

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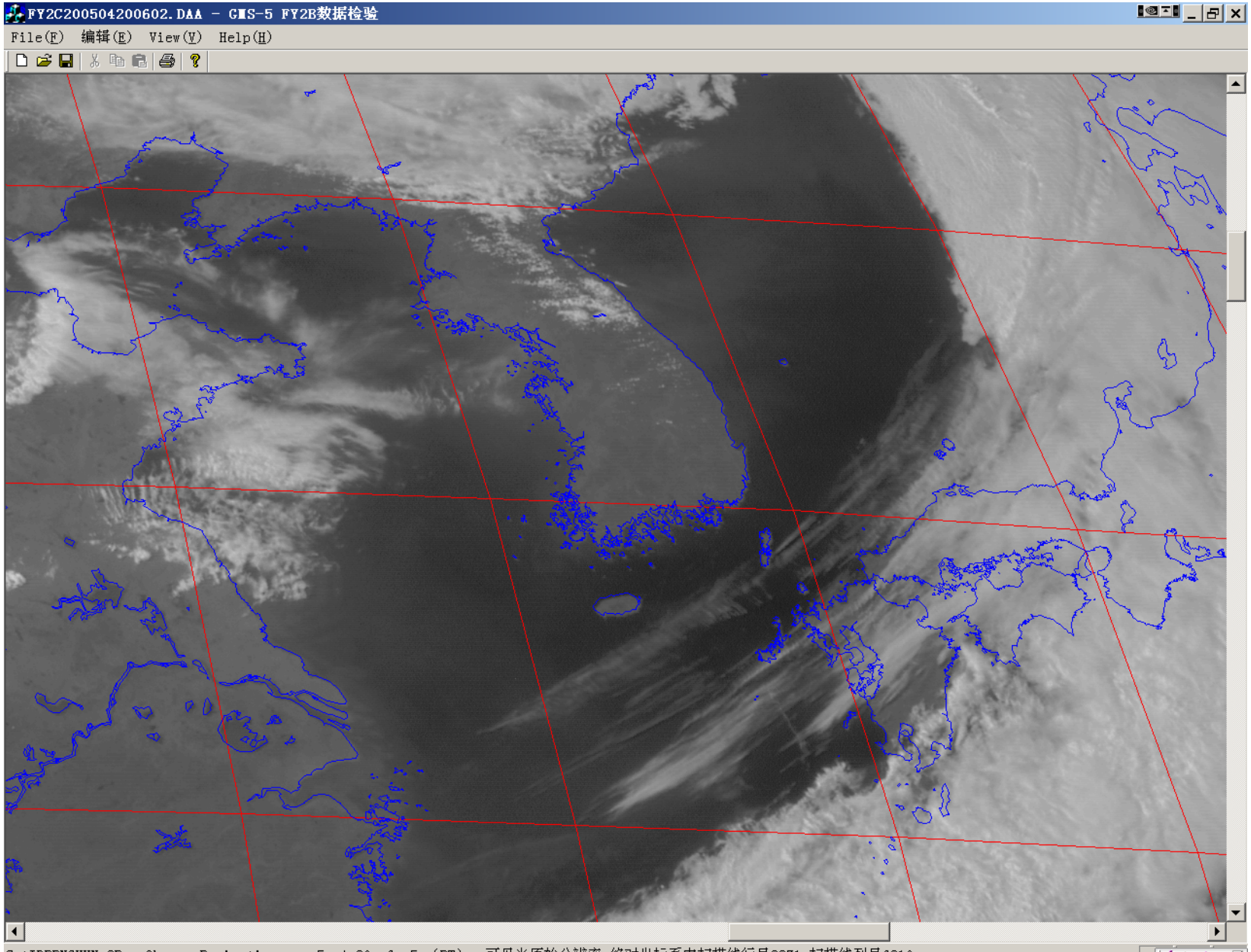

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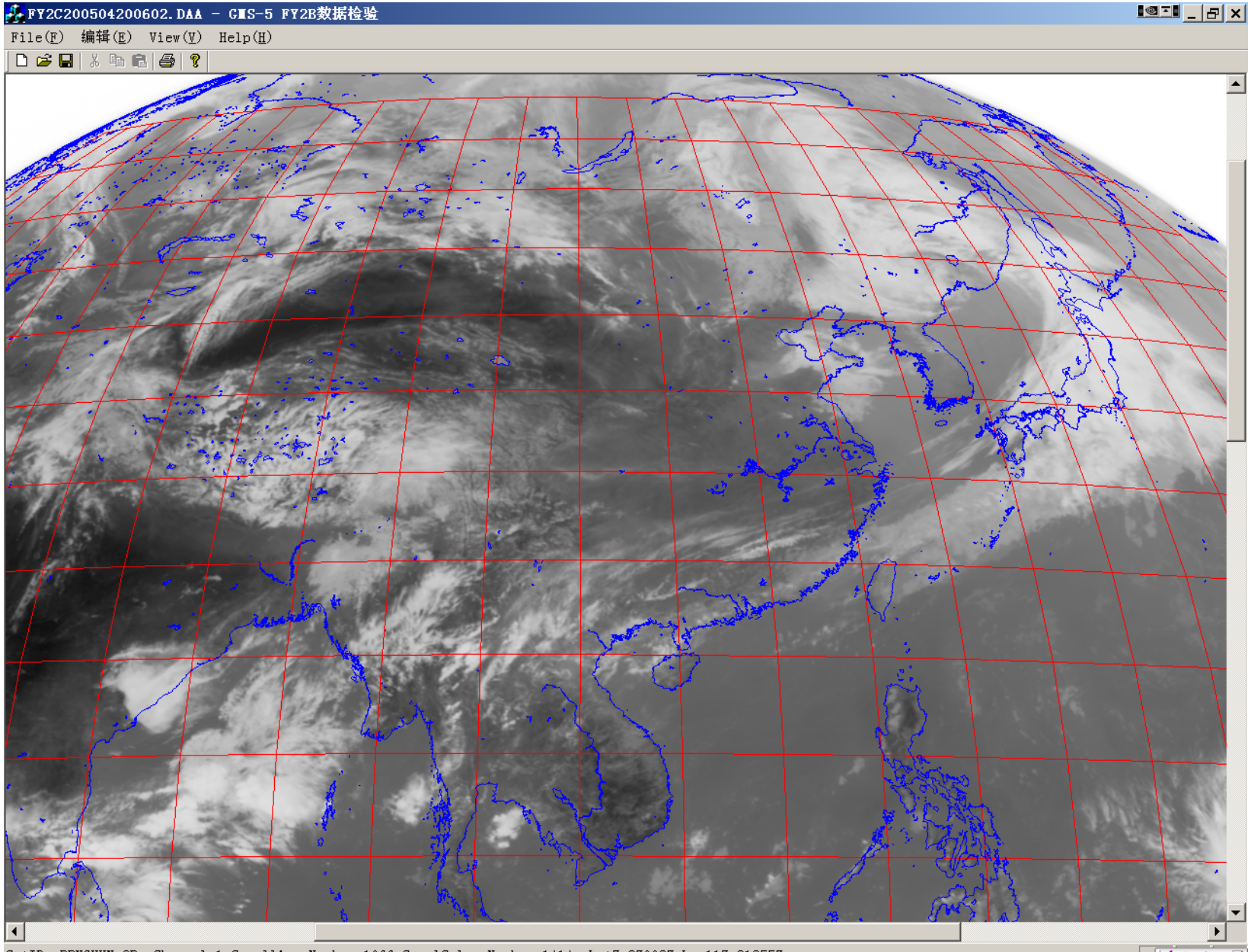

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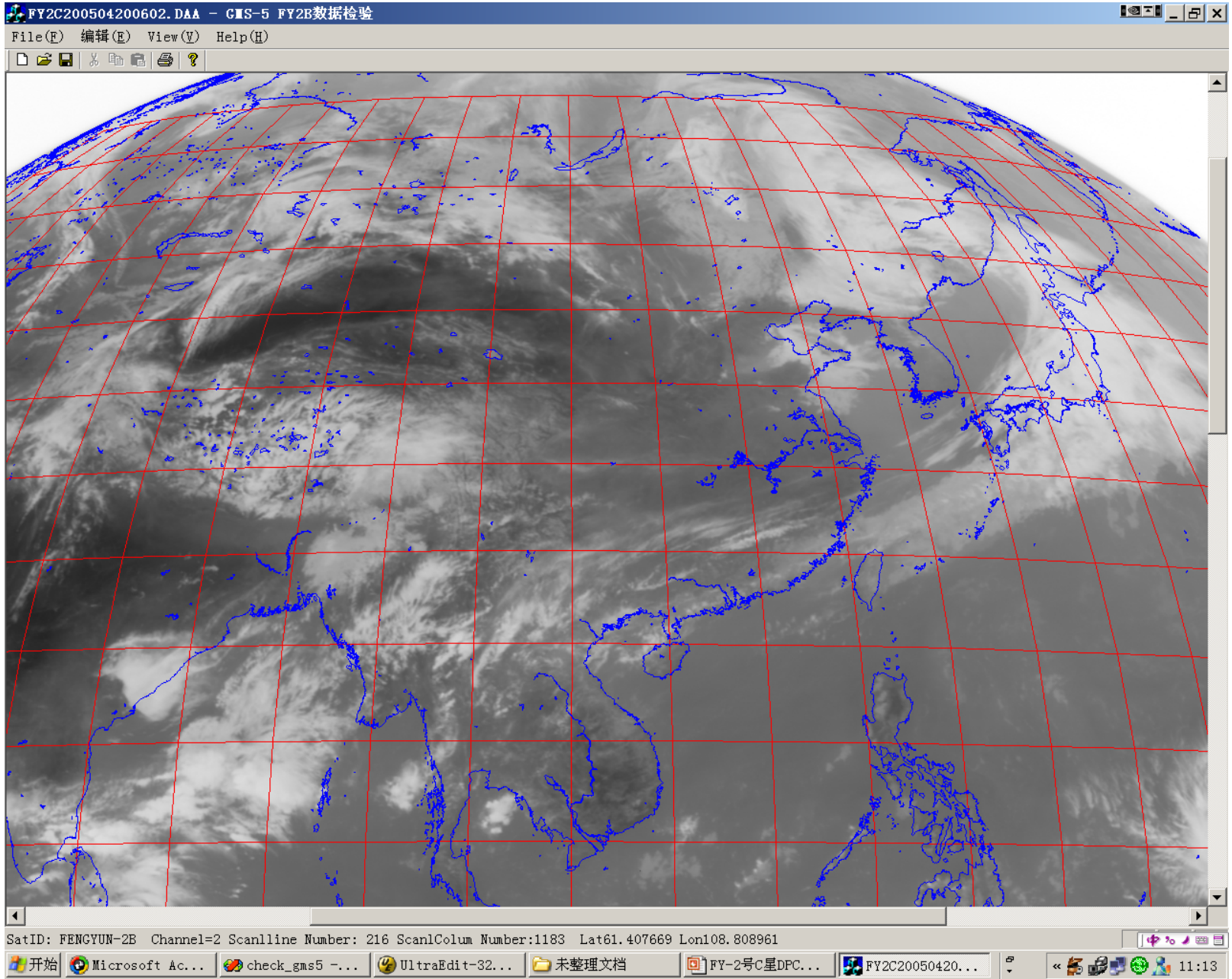
FY2C200504200602.DAA - GMS-5 FY2B数据检验
File(F) 编辑(E) View(V) Help(H)
SatID: FENGYUN-2B Channel=2 Scanlline Number: 216 ScanlColum Number:1183 Lat61.407669 Lon108.808961
开始
Microsoft Ac...
check_gms5 -...
UltraEdit-32...
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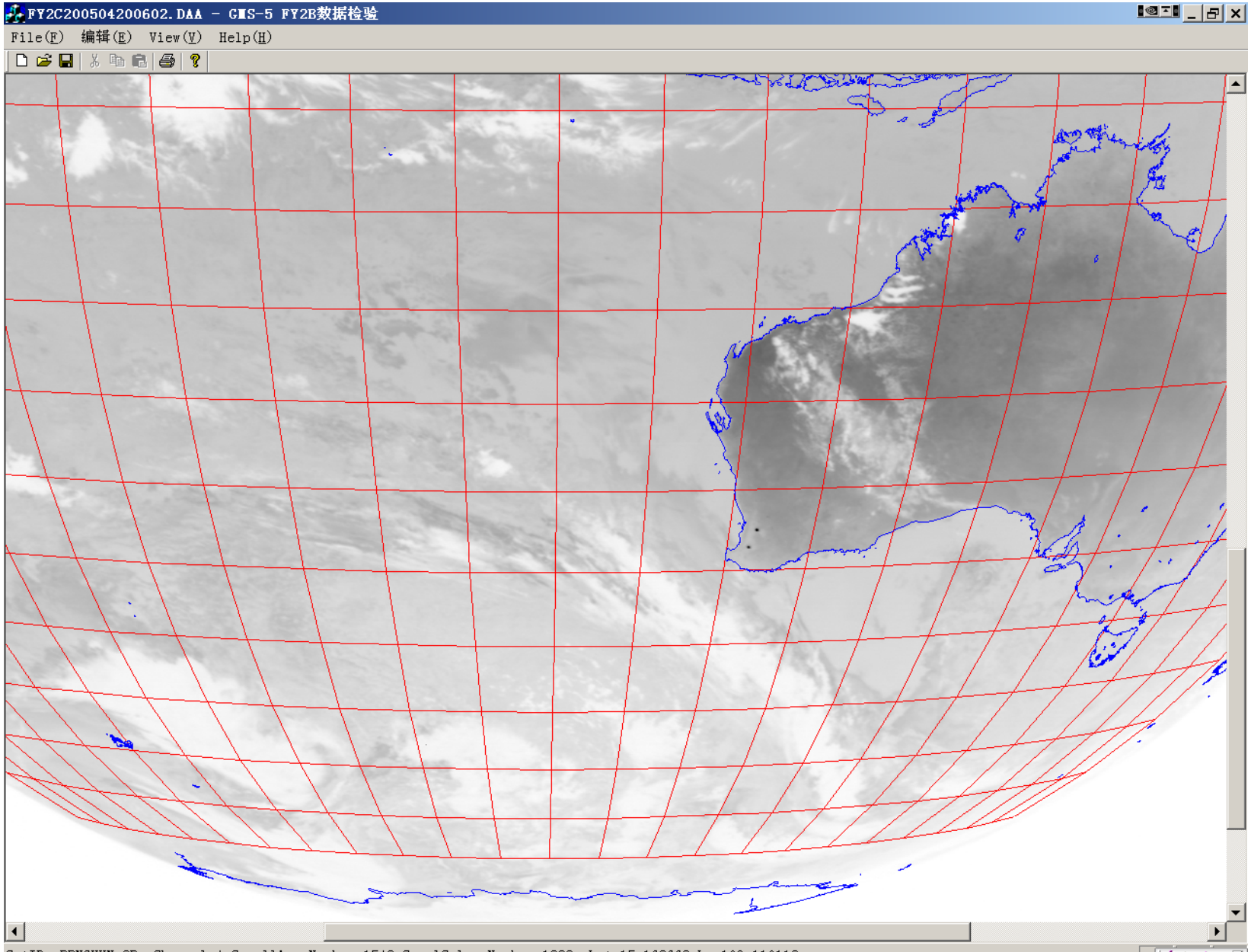
11:13

2005.4.20:06



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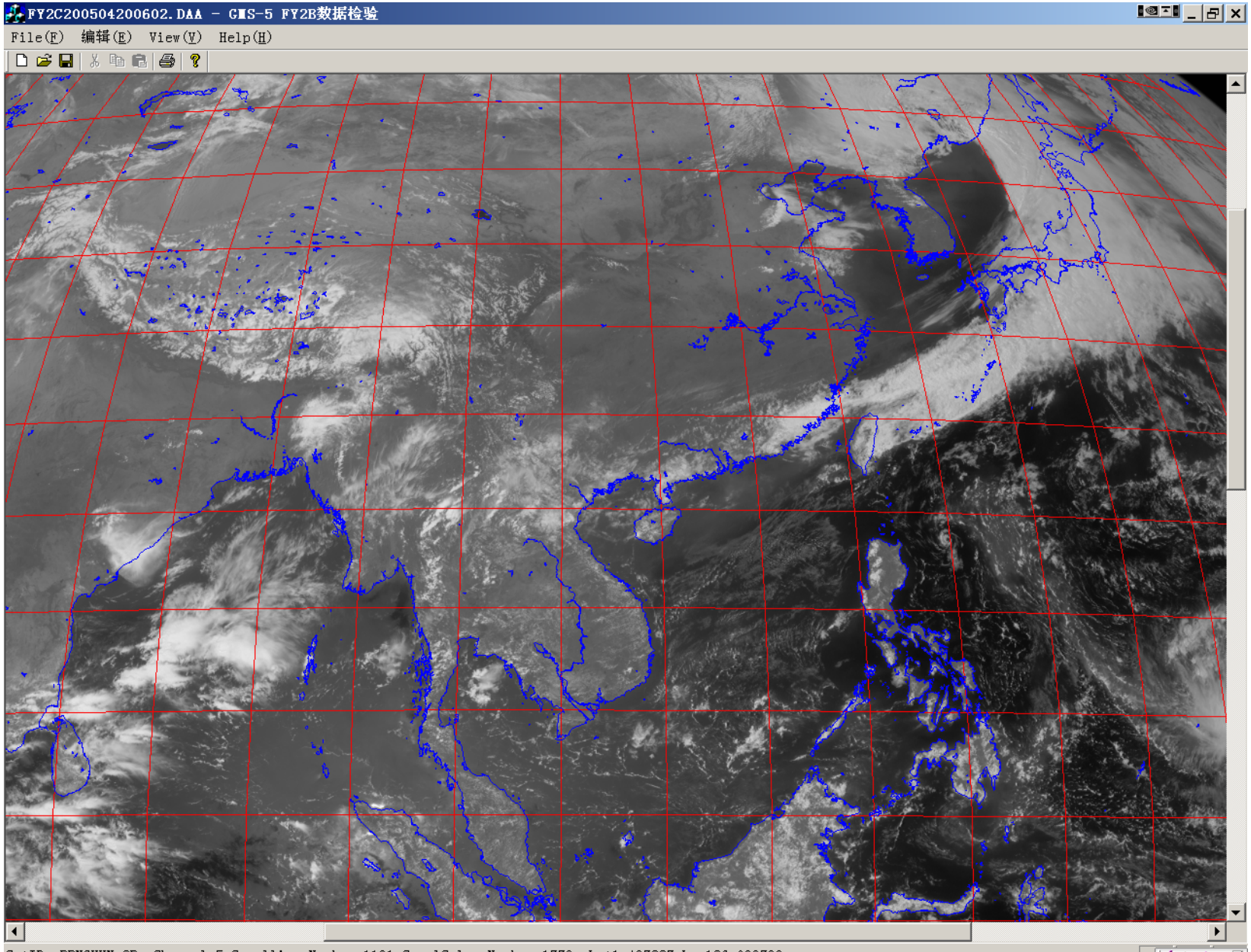
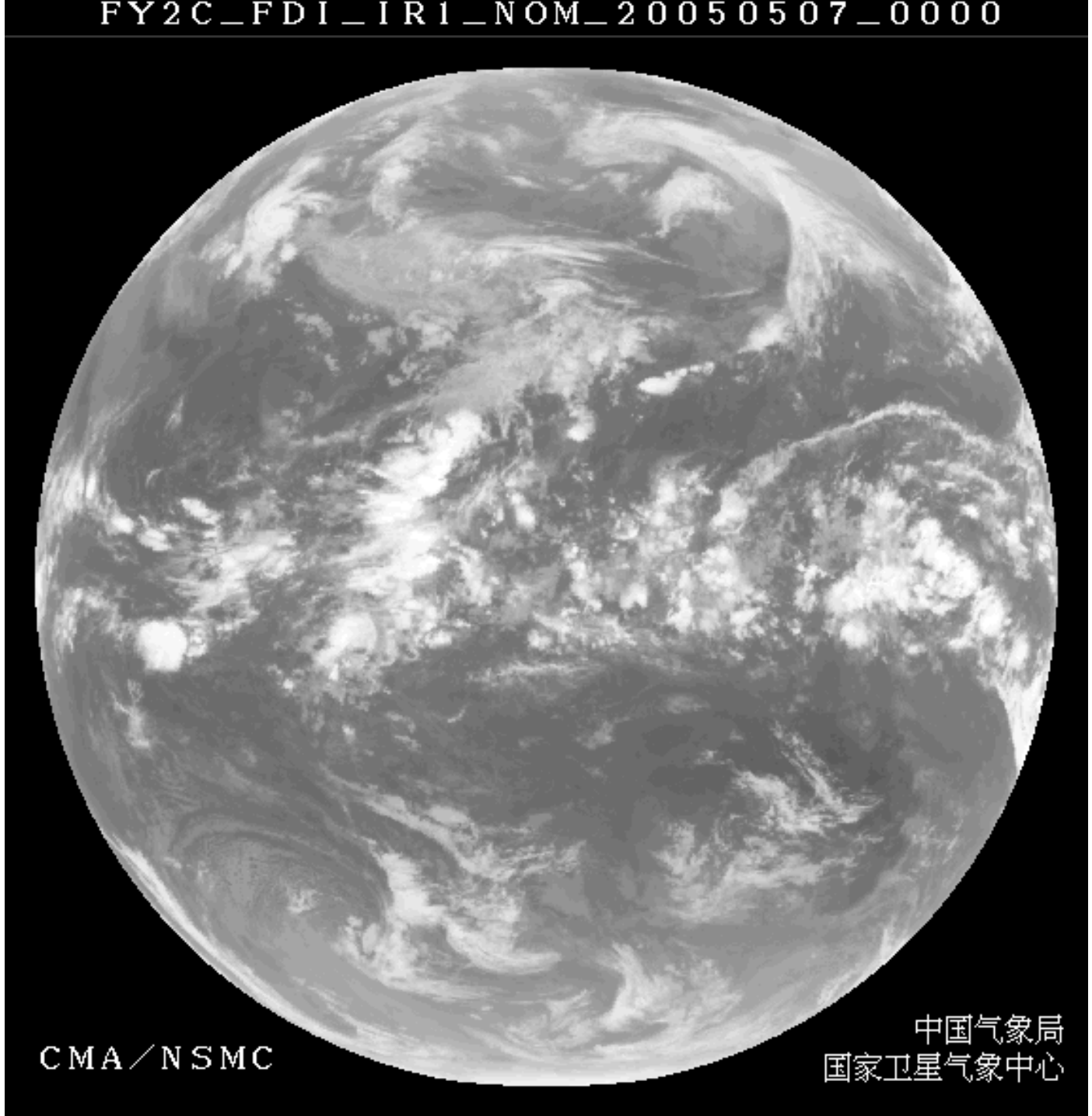
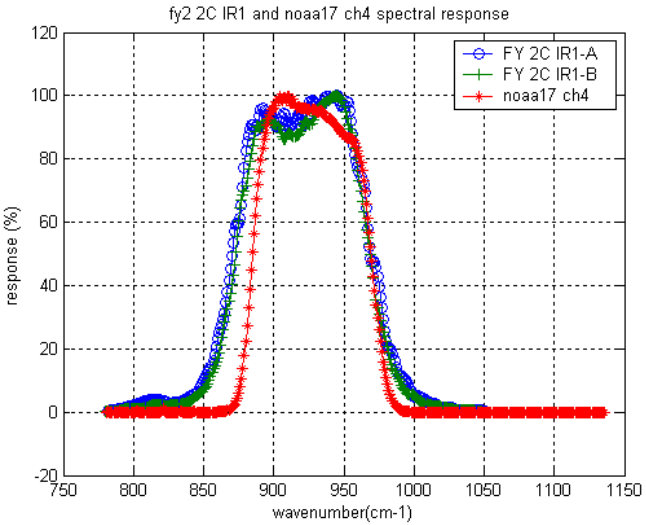
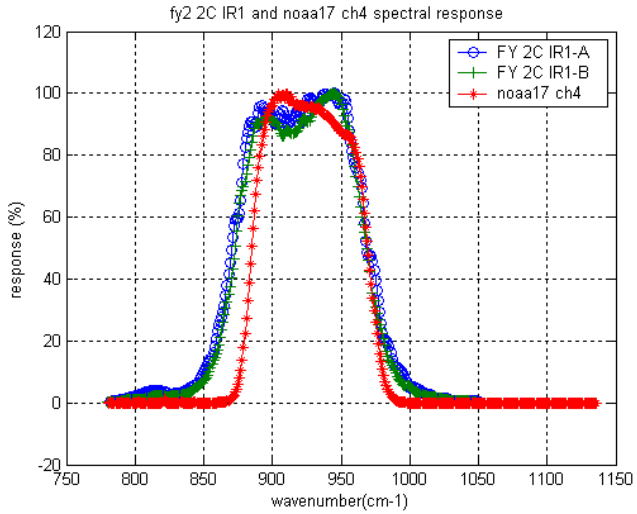


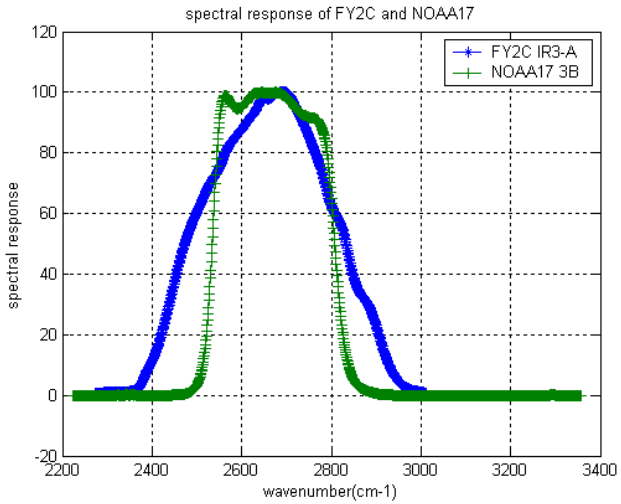

FY2C_FDI_IR1_NOM_20050507_0000
CMA／NSMC
中国气象局
国家卫星气象中心

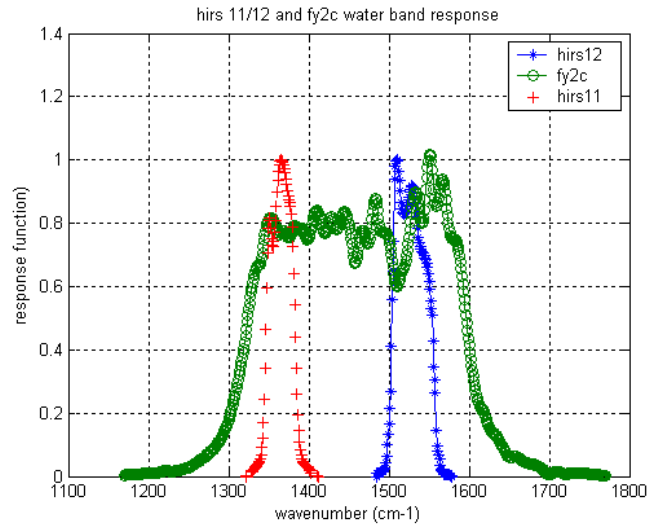
Calibration with NOAA

Spectrum Registration

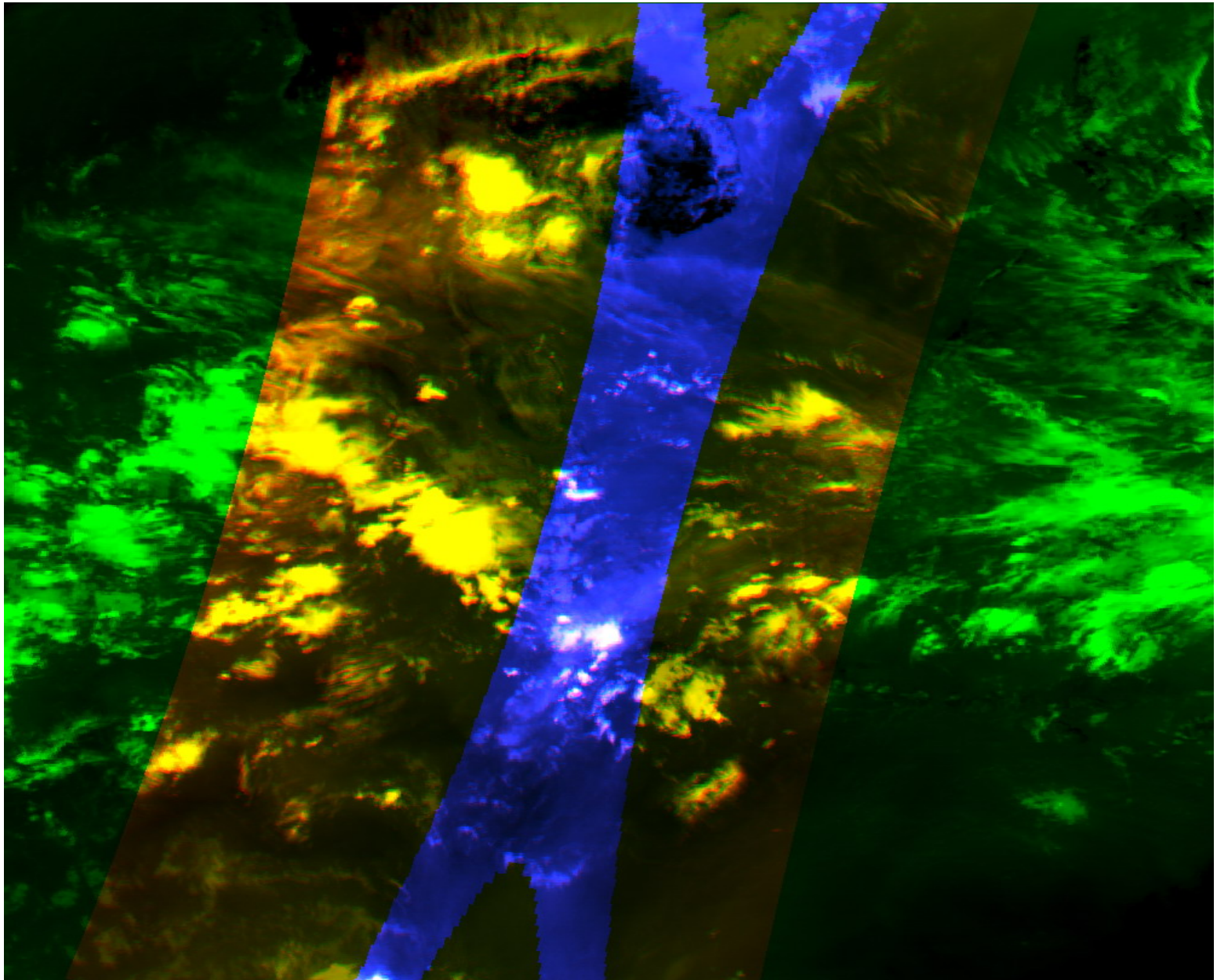




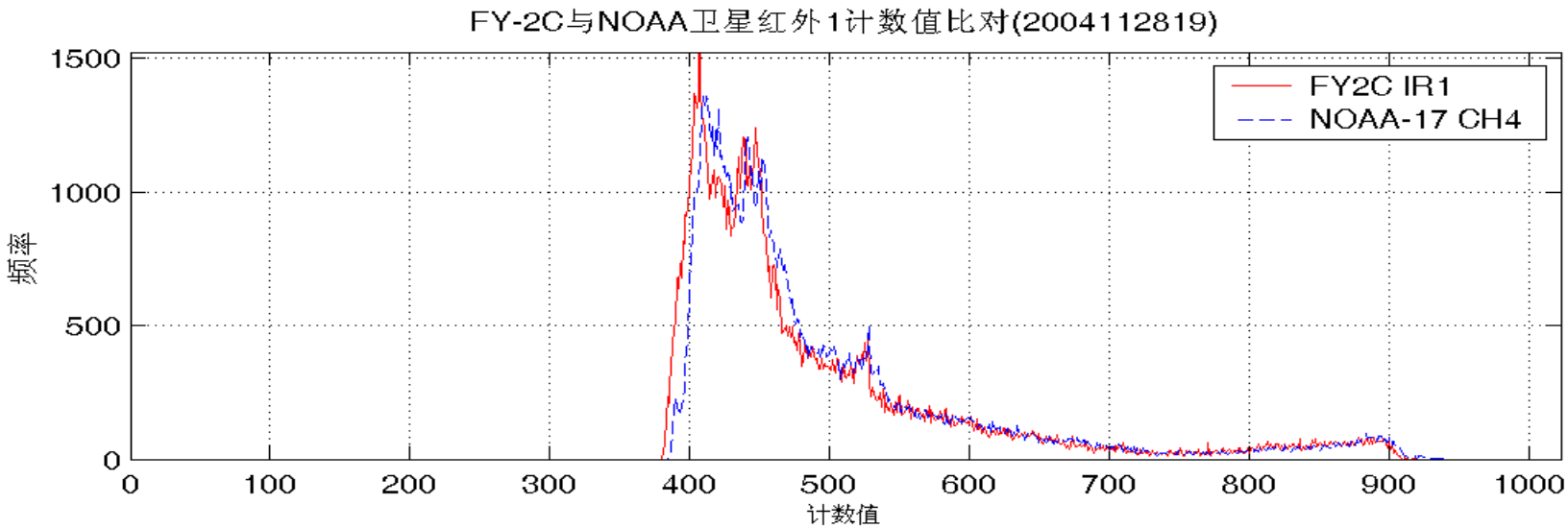


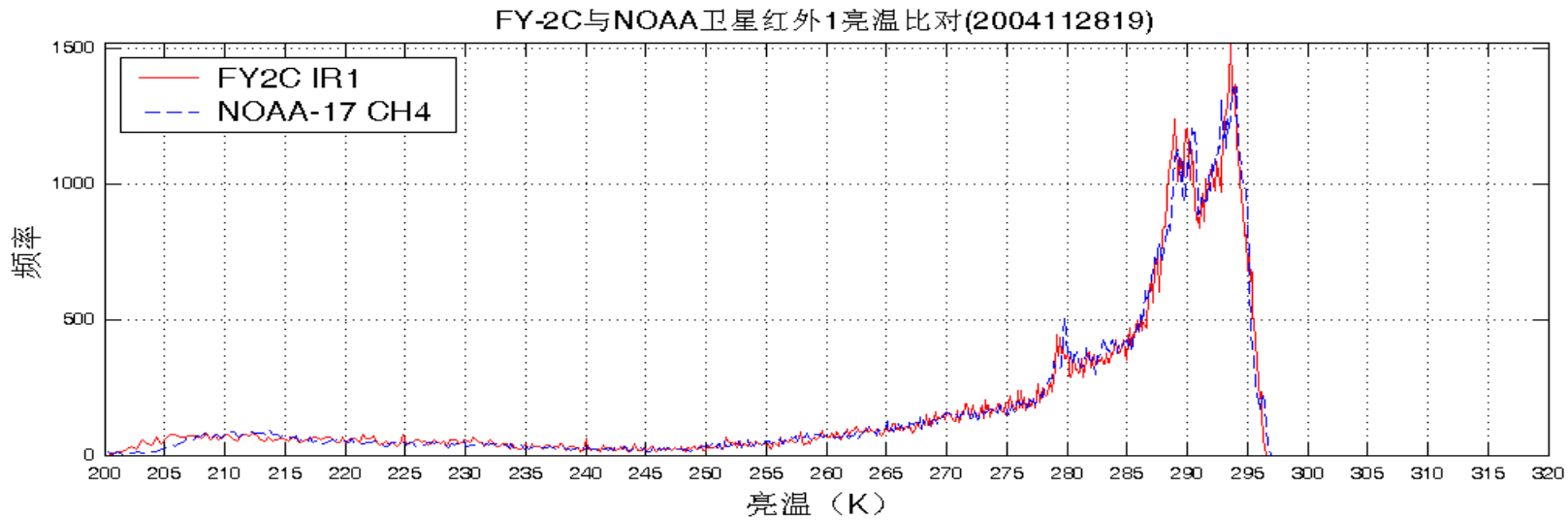


Geographic registration

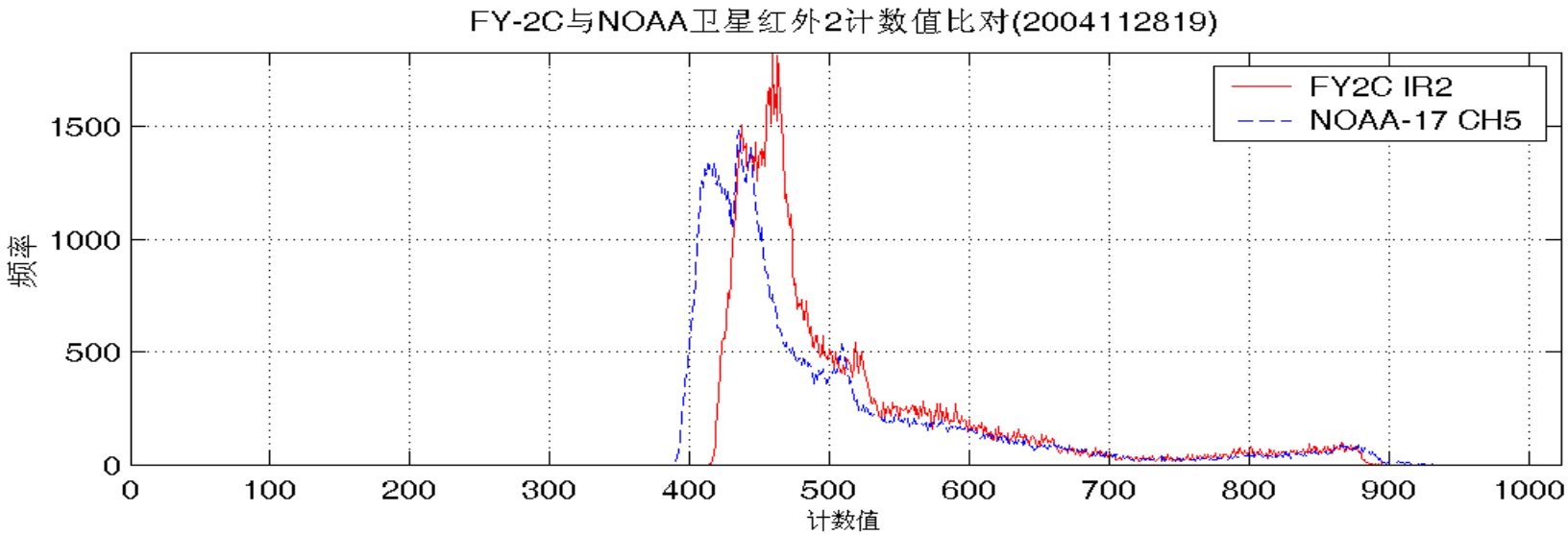


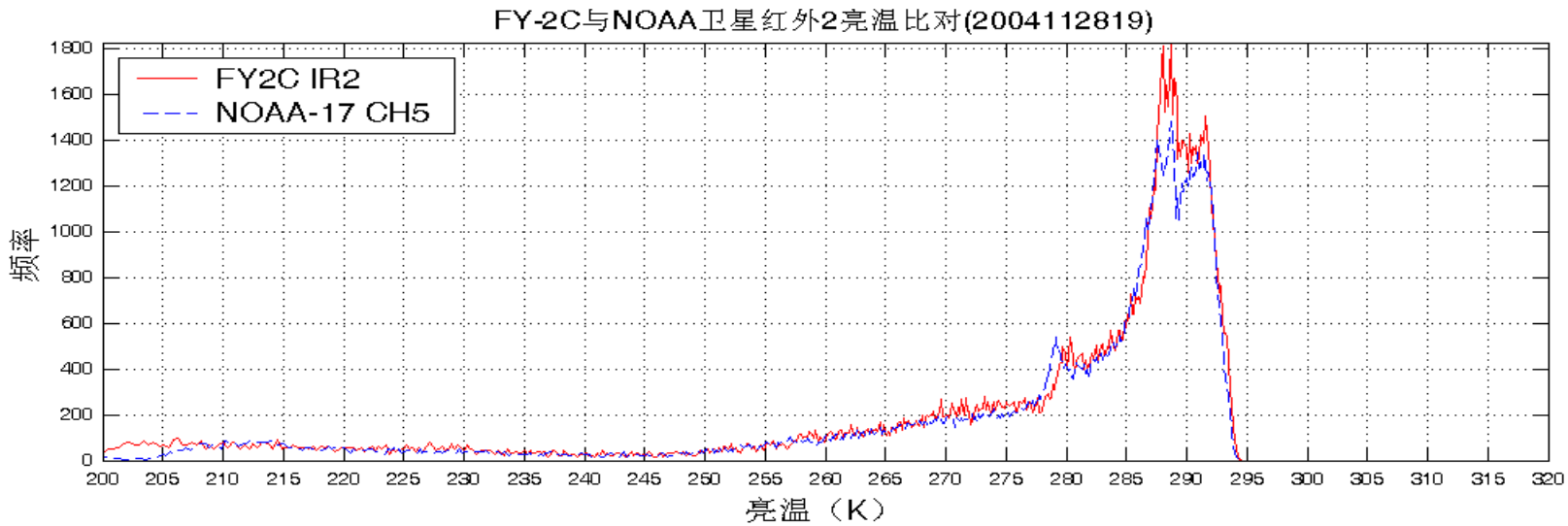
FY-2C IR1 measurement and BT compared with NOAA



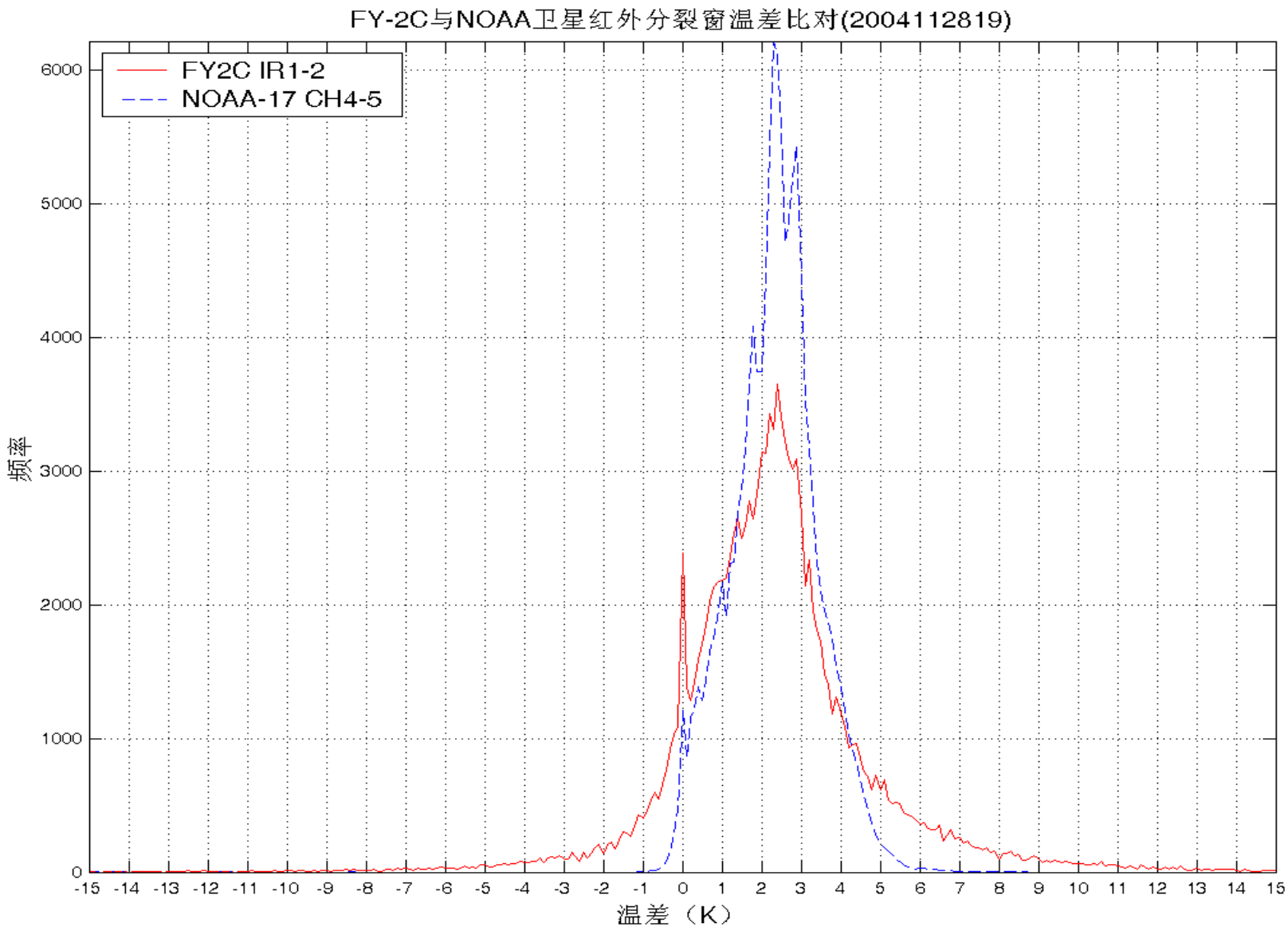


FY-2C IR2 measurement and BT compared with NOAA

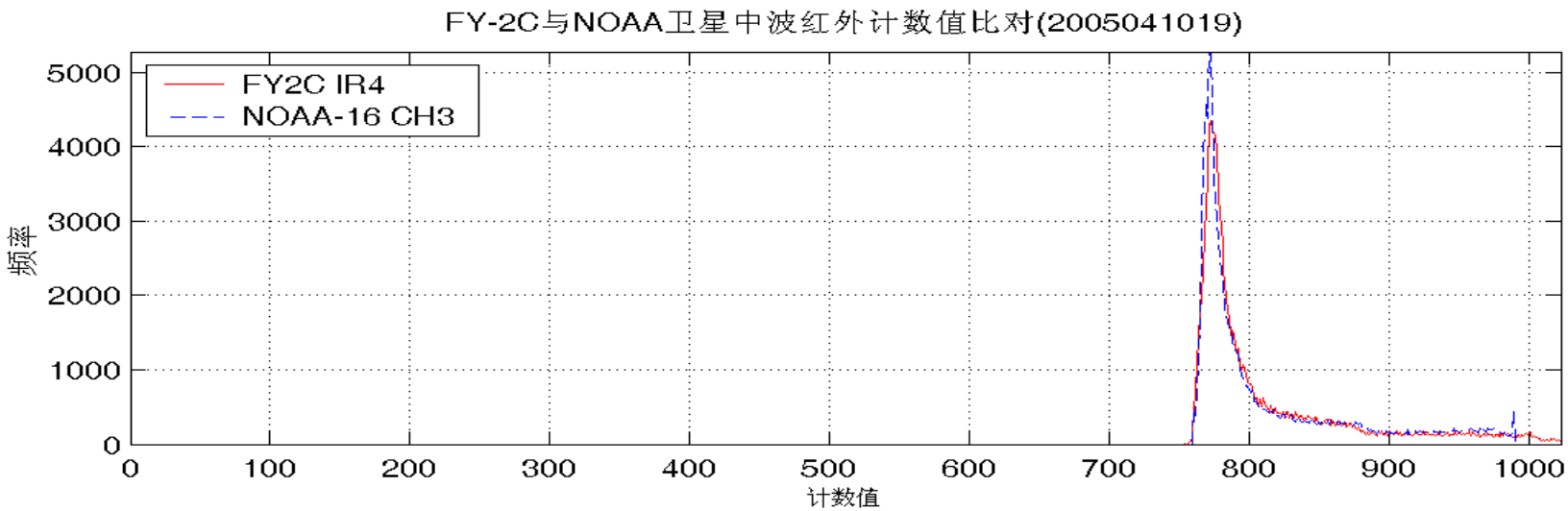


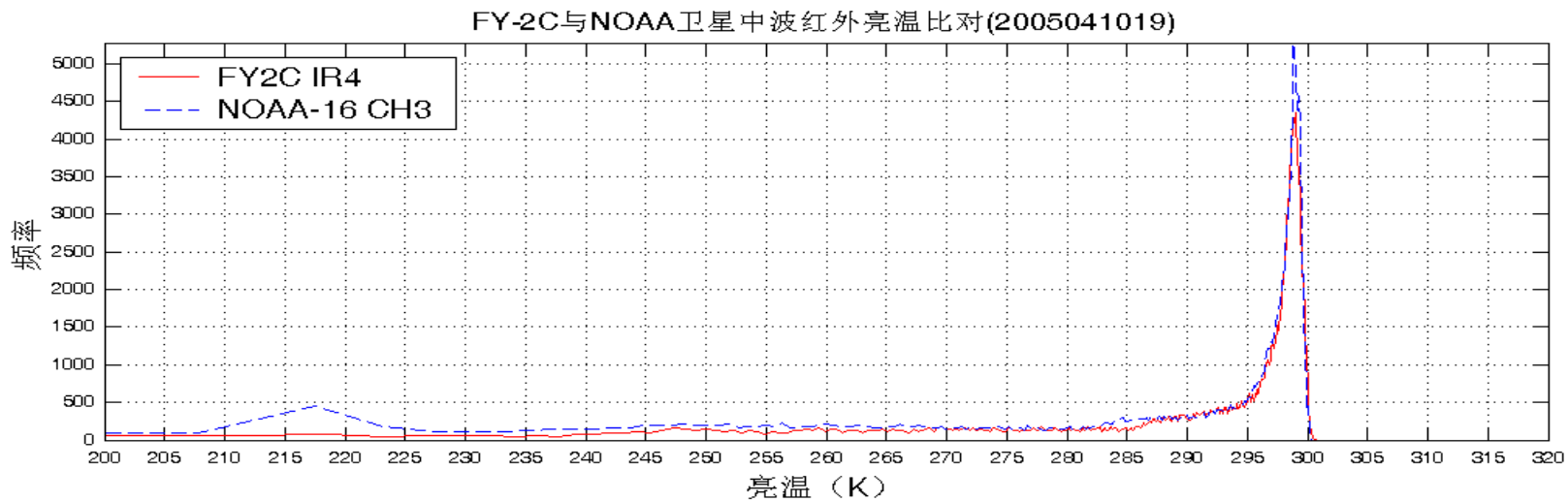


FY-2C split window difference compared with NOAA



FY-2C IR4 measurement and BT compared with NOAA

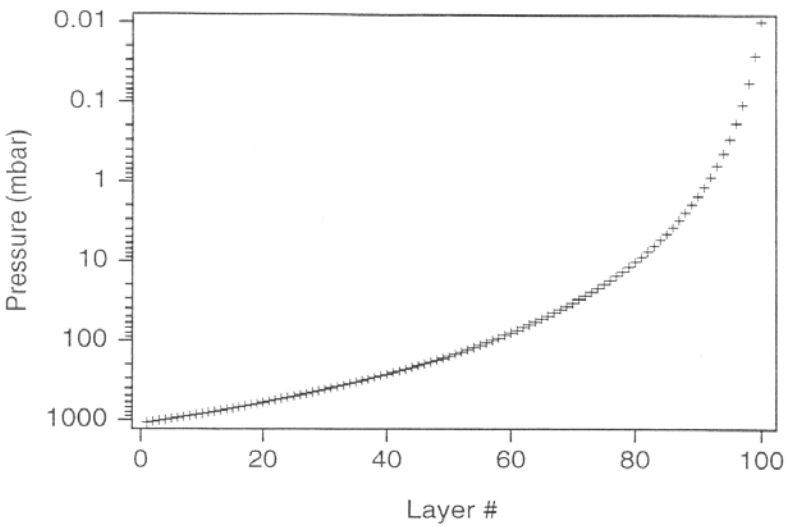


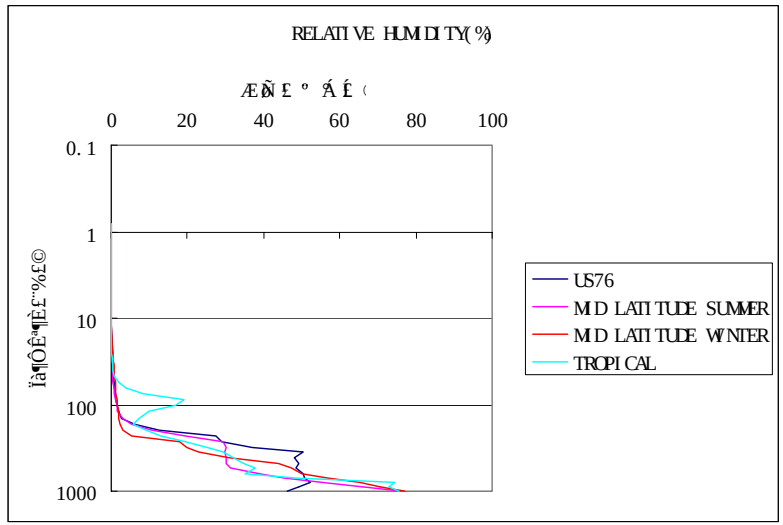


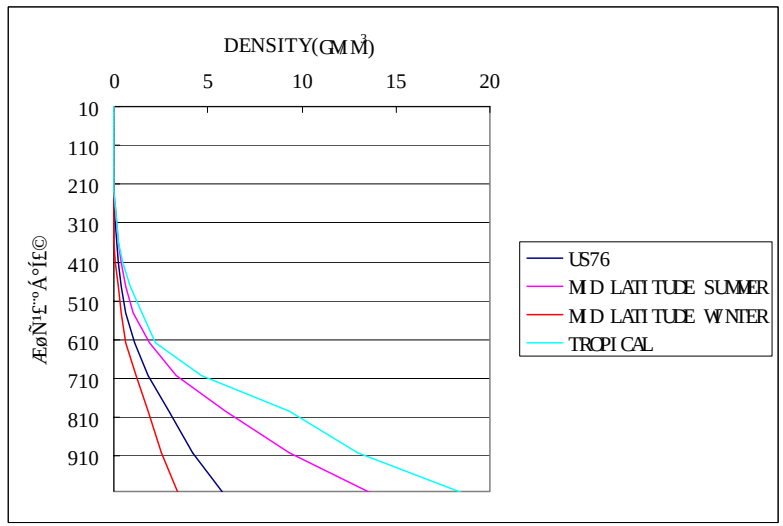
Atmospheric radiation reduction look up tables

The atmosphere is divided into 53 layers. In each layer, atmospheric conditions are constructed by the combination of 11 temperature and 11 humidity measurements. In each layer with each atmospheric status, the atmospheric optical depths in the layers are gained by integration with MODTRAN. In the integration, the atmospheric optical depths are consists of three major parts: water vapour line absorption/emit, water vapour continuous absorption/emit and absorption/emit by other atmospheric compositions. The spectrum resolution in the integration is wave number with unit cm-1. The integration spectrum scope is from 700 to 1200 for FY2B IR channel and from 1300 to 1600 for FY2B WV channel.

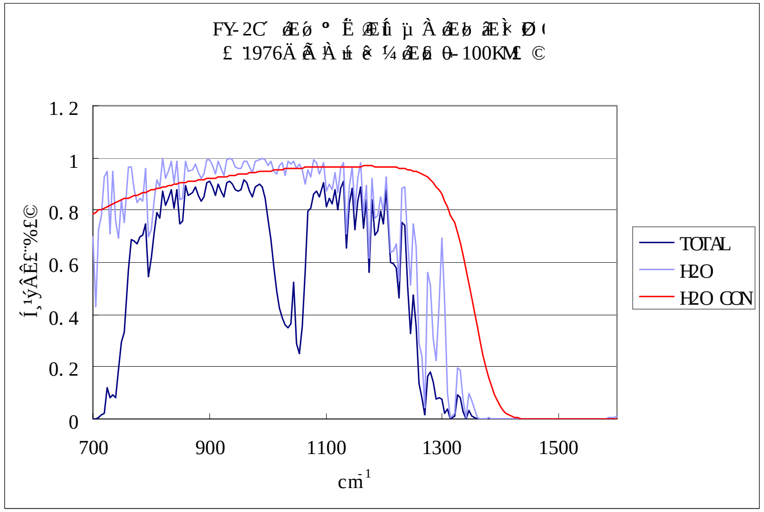
The atmosphere is divided into 53 layers. In each layer, atmospheric conditions are constructed by the combination of 11 temperature and 11 humidity measurements.

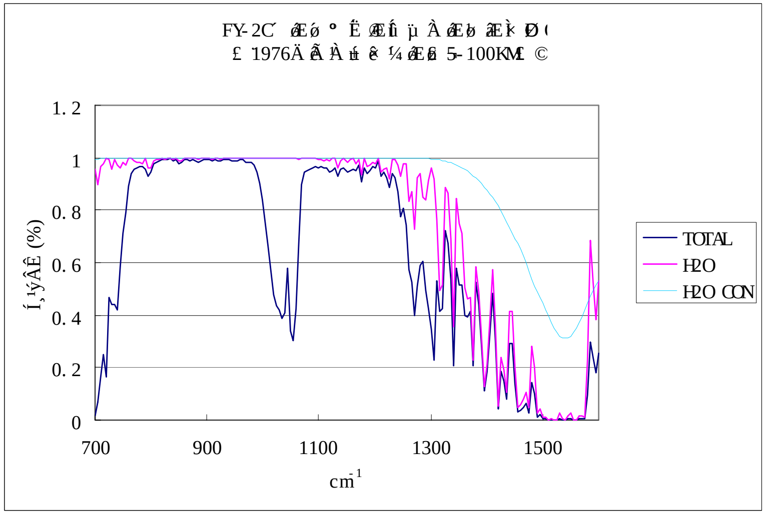


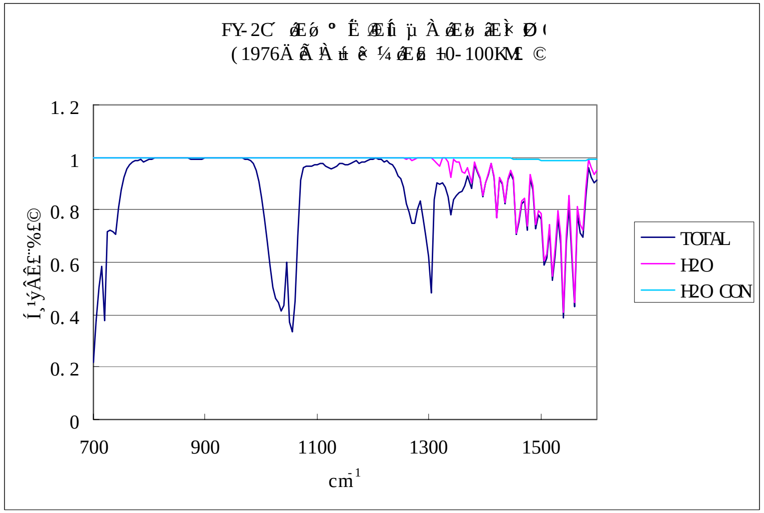


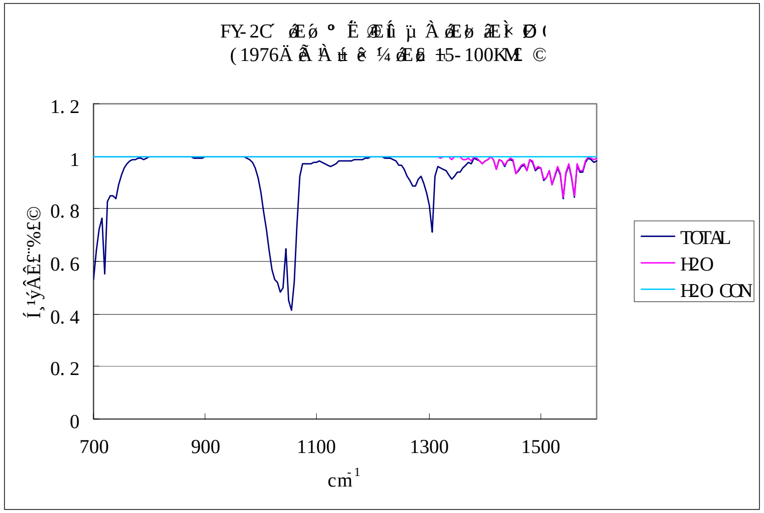


Atmospheric transmission from dif. layers to 100km



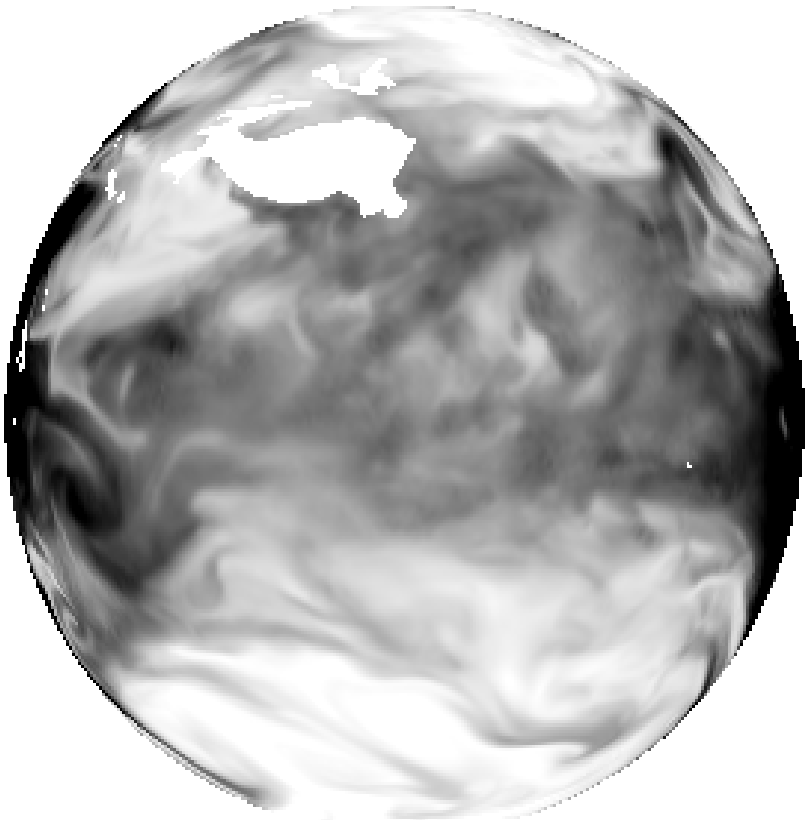




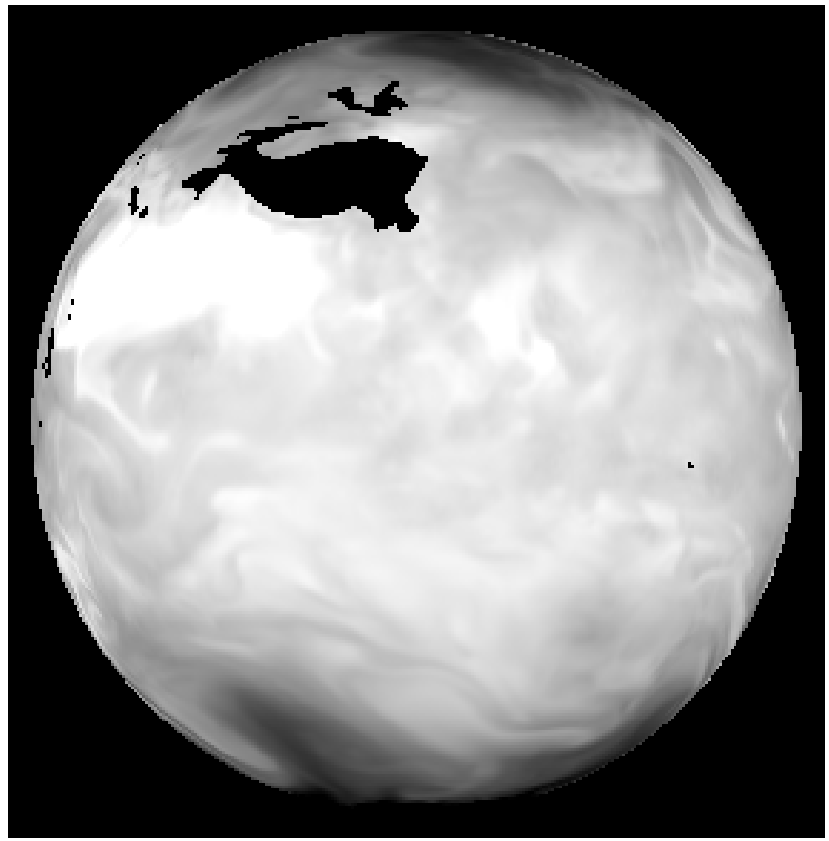


Look up Table

Wave Num (cm^{-1})	Temp. Prof. No. 1			…Temp. Prof. No. i …	Temp. Prof. No. 11		
	P_1	…P_i…	P_N	……	P_1	…P_i…	P_N
700	**O**	**P**	**T**	**I**	**C**	**A**	**L**
701				……			
…	…	…		……		… …	… …
1599	**T**	**H**	**I**	**C**	**K**		
1600	**N**	**E**	**S**	**S**			



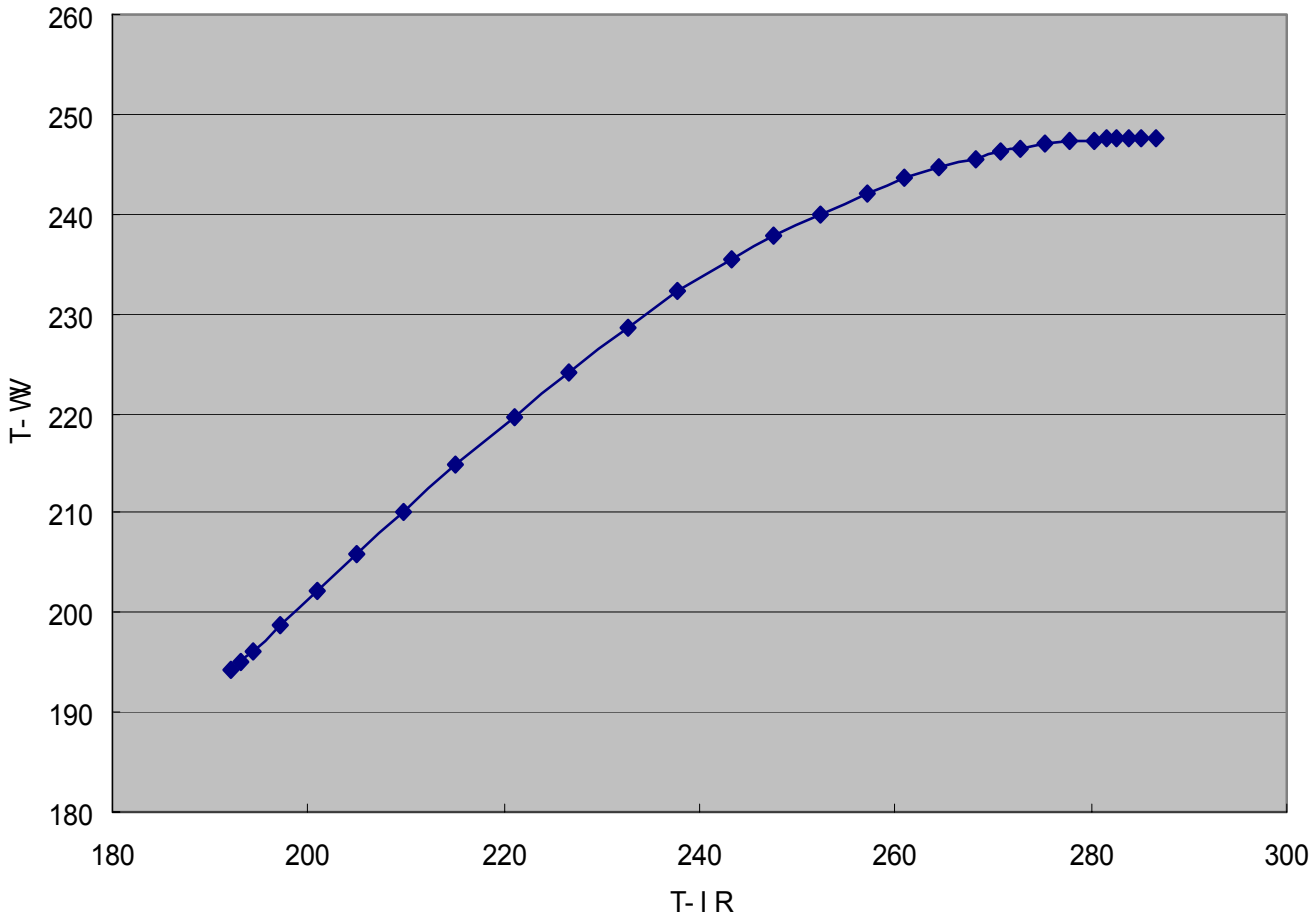
Layer 05□800hPa□
Atmosphere Reduction
Example

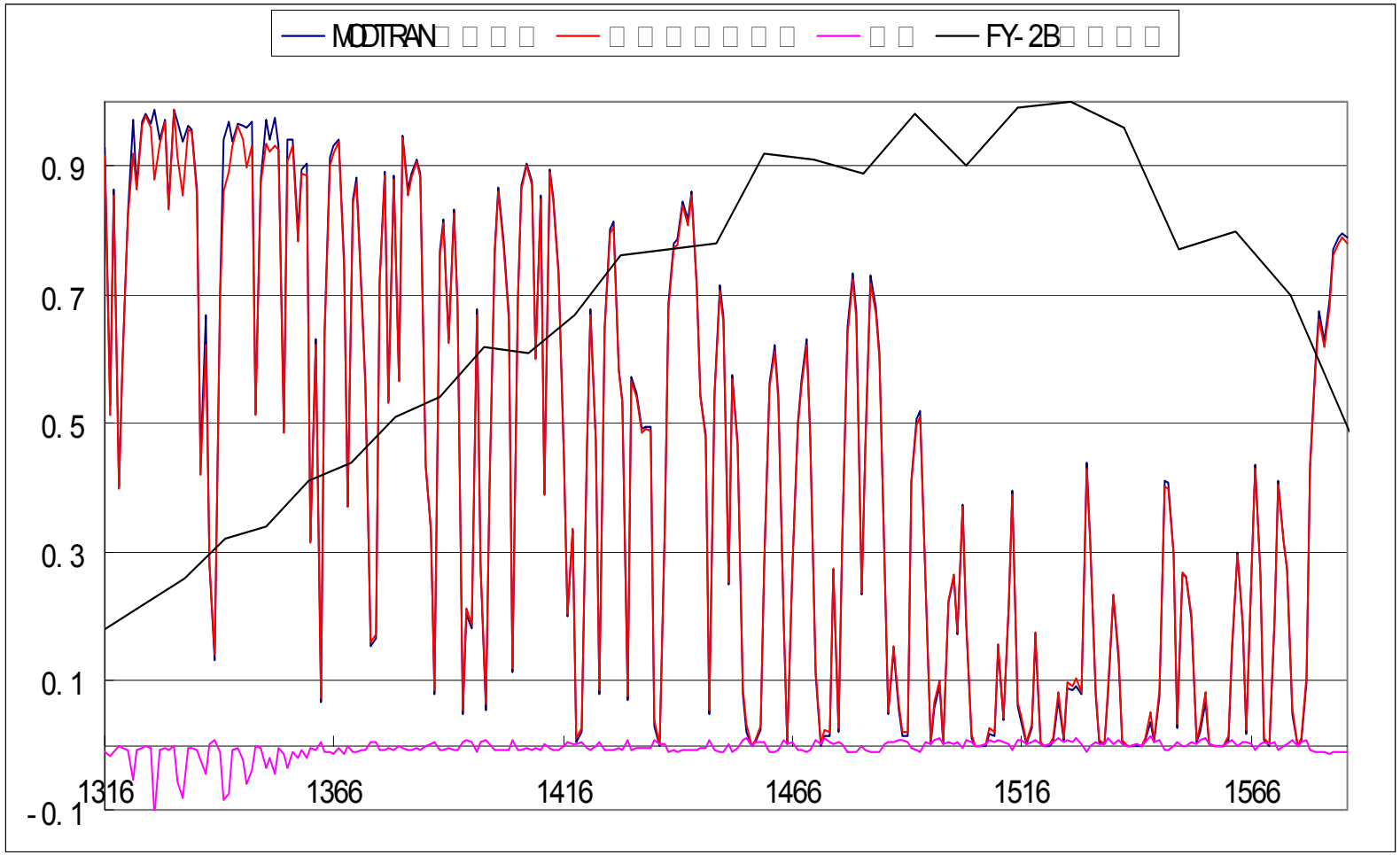


Layer 05□800hPa□Incident
Radiation

IR Atmosphere Reduction

Opaque cloud IR and WV channel Brightness temperature relationship





7.183km--7.476km,Compare with MODTRAN

Products from FY2C

Name of Product	Coverage	Time/Day
Wind	50°N-50°S 55°E-155°E	4
SST	60°N-60°S 45°E-165°E	8
Upper Troposphere Humidity	60°N-60°S 45°E-165°E	8
ISCCP Data set	60°N-60°S 45°E-165°E	8
Precipitation Index	60°N-60°S 45°E-165°E	8
Precipitation Estimation	60°N-60°S 45°E-165°E	4
Cloud Classification	60°N-60°S 45°E-165°E	8
Cloud Amount	60°N-60°S 45°E-165°E	8
Humidity Profile from Cloud	50°N-50°S 55°E-155°E	8
Perceptible Water in Clear Sky Region	60°N-60°S 45°E-165°E	8
Outgoing Long wave Radiation	60°N-60°S 45°E-165°E	8
Solar Irradiance	60°N-60°S 45°E-165°E	1
Snow Cover	60°N-60°S 45°E-165°E	1
Sea Ice	60°N-60°S 45°E-165°E	1
Flood Monitoring	China	1
Soil Moisture	60°N-60°S 45°E-165°E	1
Fire Monitoring	China	24
Tropical Cyclone Position and Intensity	Western Pacific and India Ocean	24
Sand Storm Monitoring	China and Mongolia	8
Fog	China	24
TBB	60°N-60°S 45°E-165°E	8

Cloud Classification

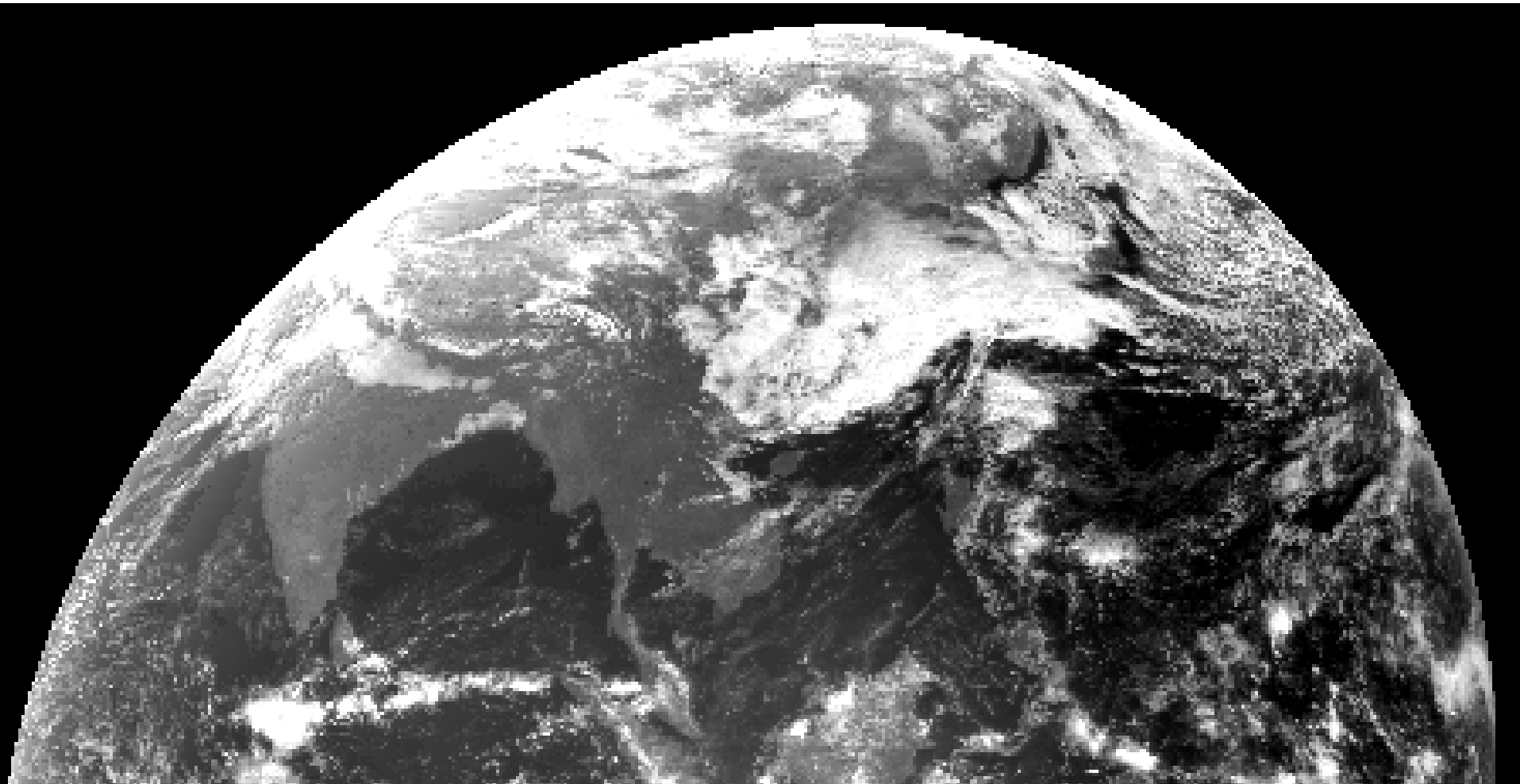
Cloud Classification

- Cloud filtering mainly performs three jobs:
- To separate high cloud from low cloud and surface named as high cloud detection.
- To separate cloud from surface named as cloud detection.
- Cloud Classification.

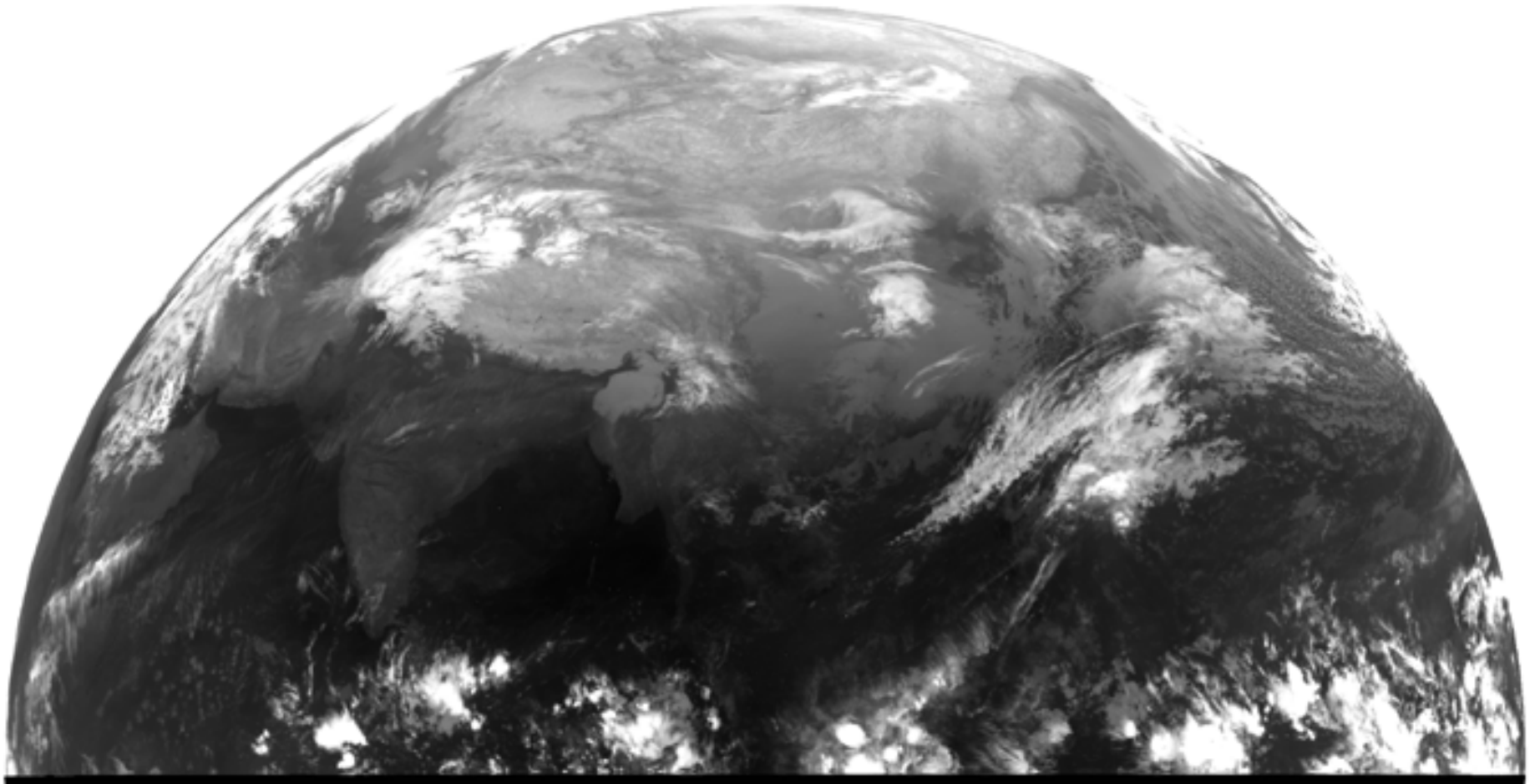
Why cloud classification job have to be done by the above mentioned three steps

- High cloud detection can be detected with WV-IR relationship. High cloud is defined relative to sea level altitude.
- High cloud detection does not work in Tibetan Plateau.
- Cloud is defined relative to topography.

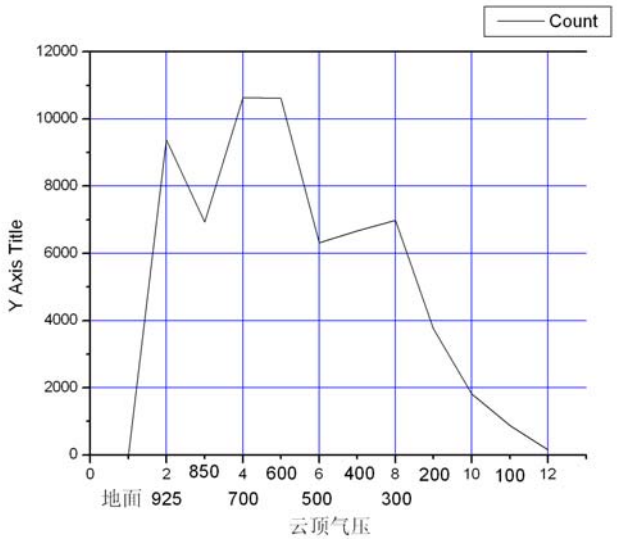
VIS Image

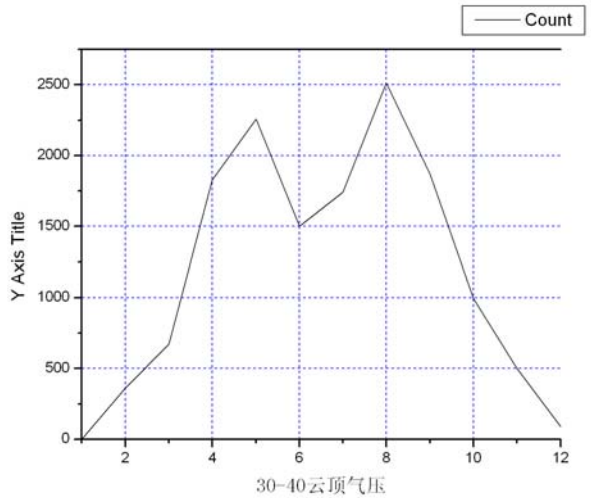


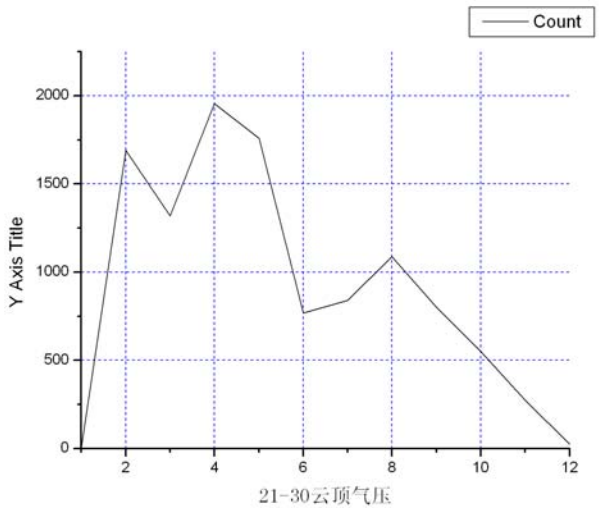
IR Image

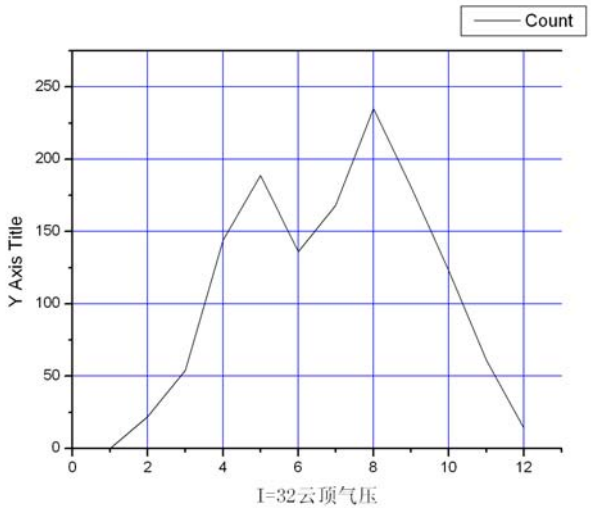


Statistics show that cloud top is relatively less appear in mid troposphere around 500 hPa









High cloud detection

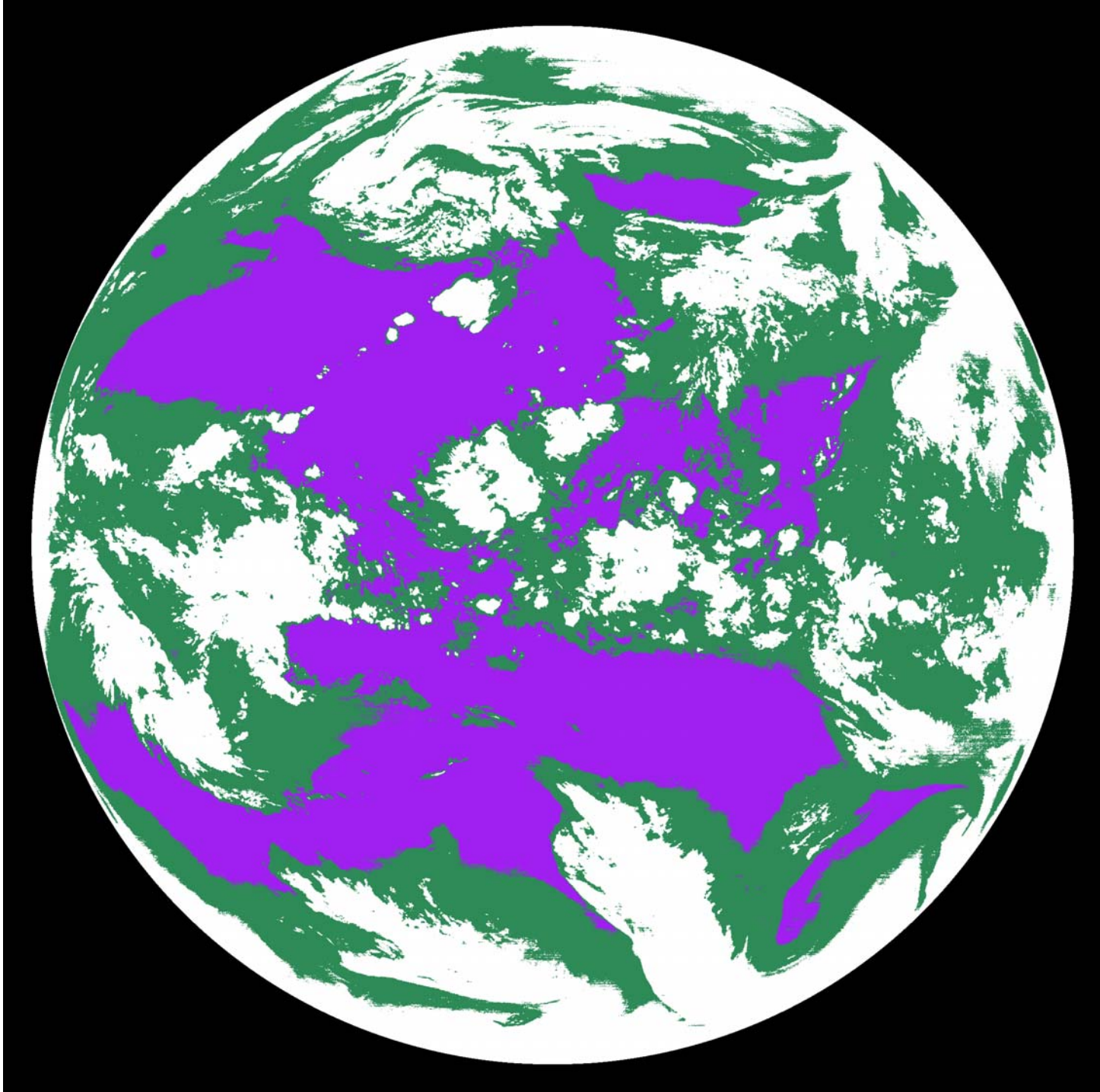
- Performed on the pixel bases with infrared and water vapour channels.
- Atmospheric reduction corrections are made.
- Correlation between the two channel measurements is calculated for each pixel in a 9 pixel area around it.
- This procedure runs well except in Tibetan Plateau where some ground features are shown in winter water vapour images and are catalogued as high cloud. Thus in Tibetan Plateau, high cloud pixels should pass cloud detection procedure as well.

In high cloud detection stage, image pixels are subject to one of the following three groups

low cloud or clear sky

High Cloud

Unknown

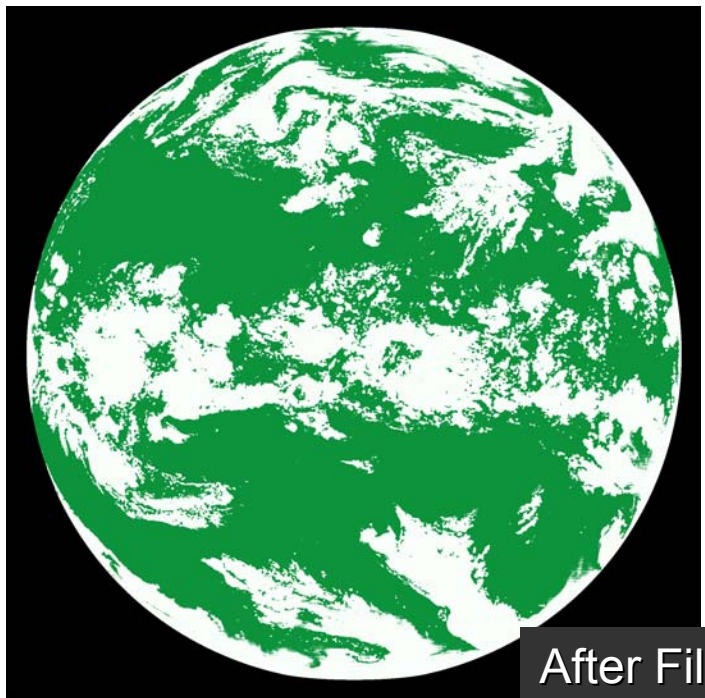


IR/WV correlation is used to separate high cloud from the others.

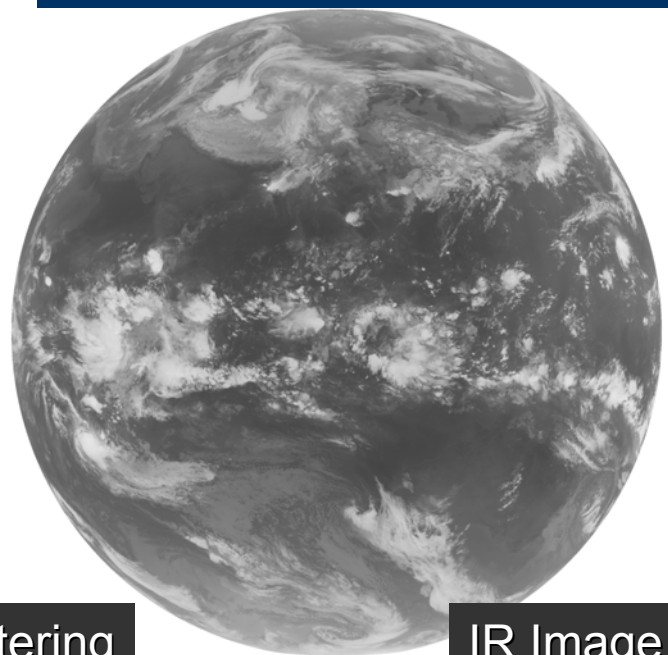
On the correlation distribution figures□Left□are noisy.

IR/WV correlation

After filtering high cloud is shown

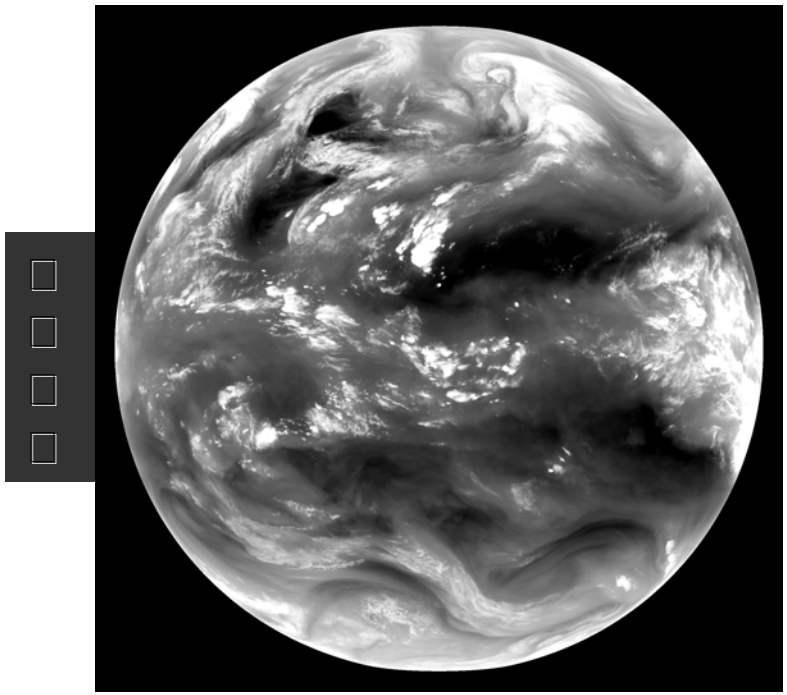


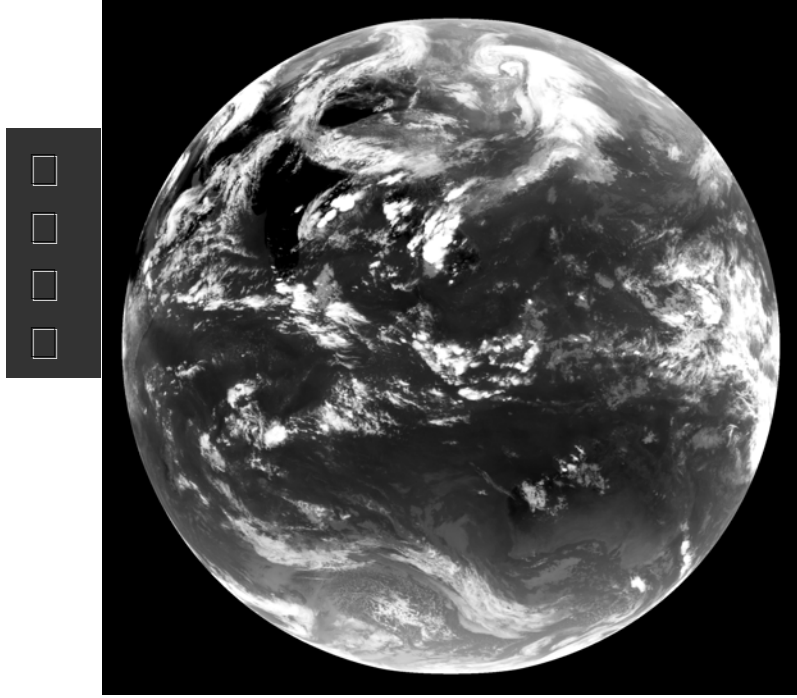
After Filtering

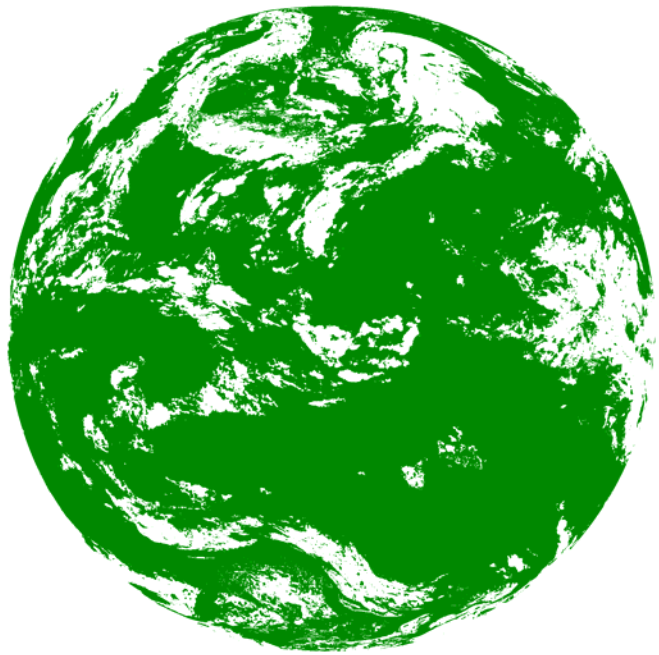


IR Image

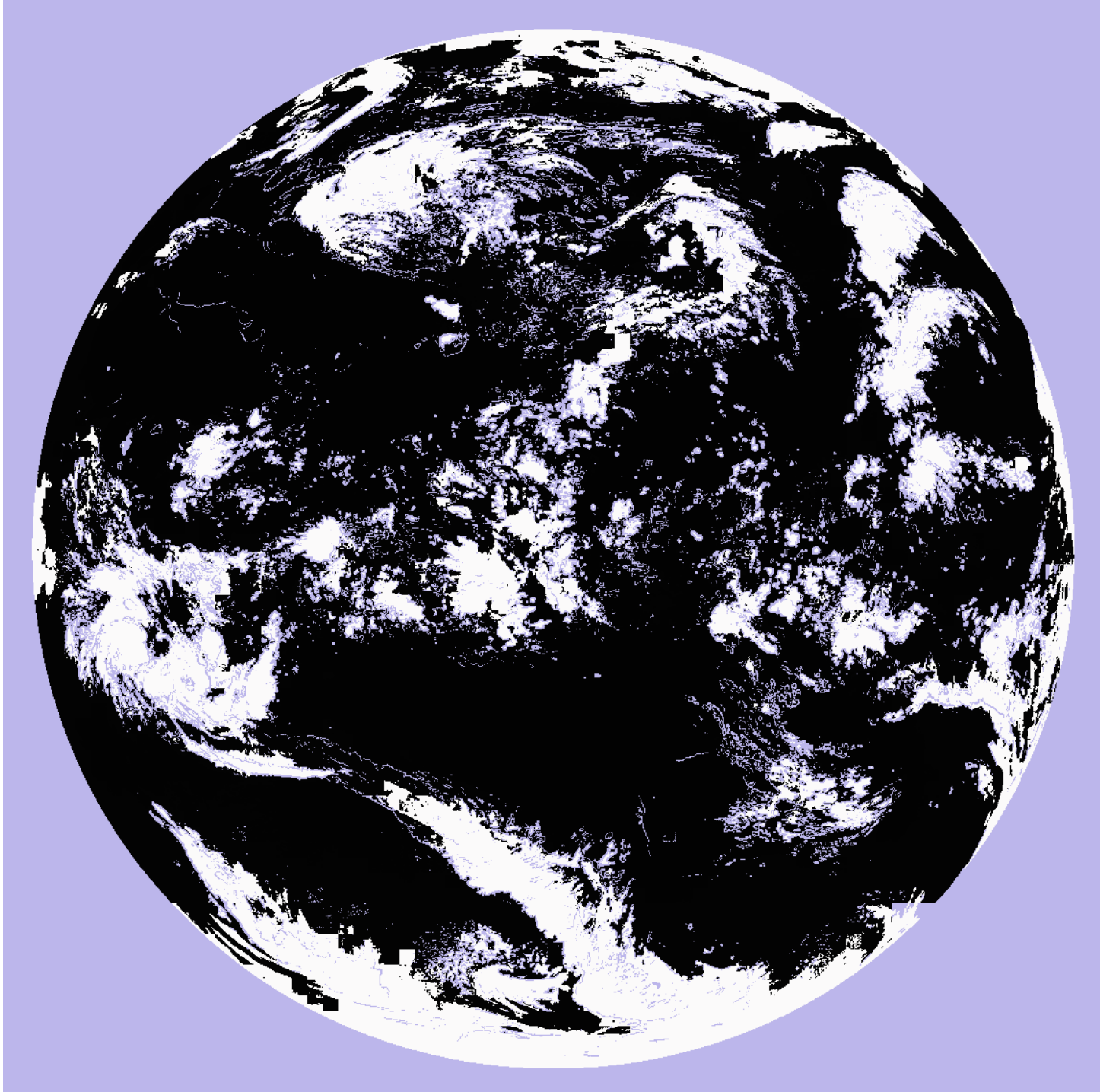
High Cloud Detection







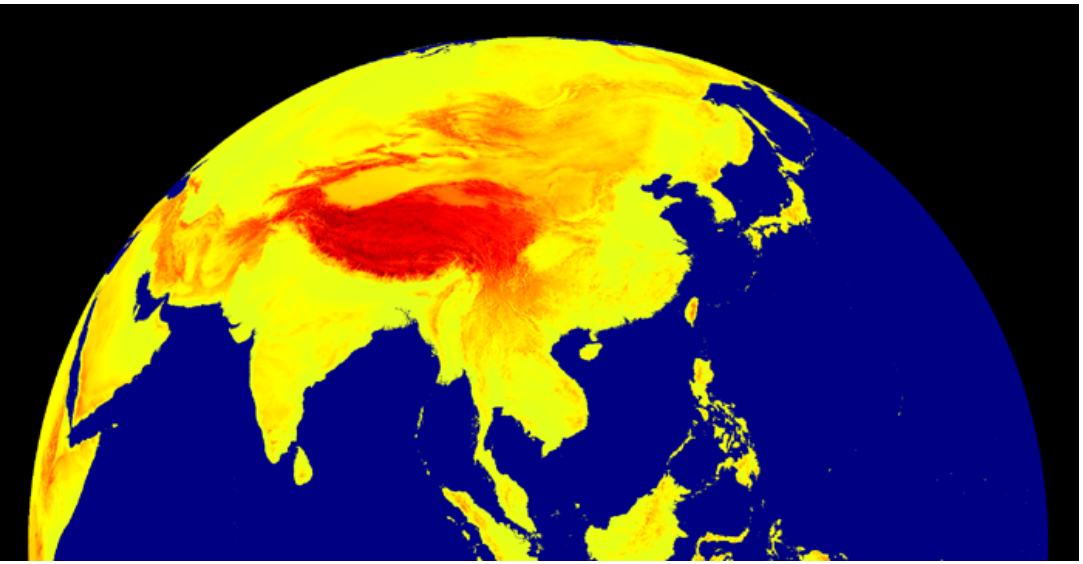
FY2C 200504190456 (UTC



Cloud Detection

Cloud detection

- Cloud detection is performed with dynamical threshold method on the segment bases.
- Segment size is 32×32 pixels.
- Infrared and visible channels are basic data; water vapour channel is also used.
- In land area, different surface elevations and land characters are separate.
- In ocean area, deviation analysis is made.

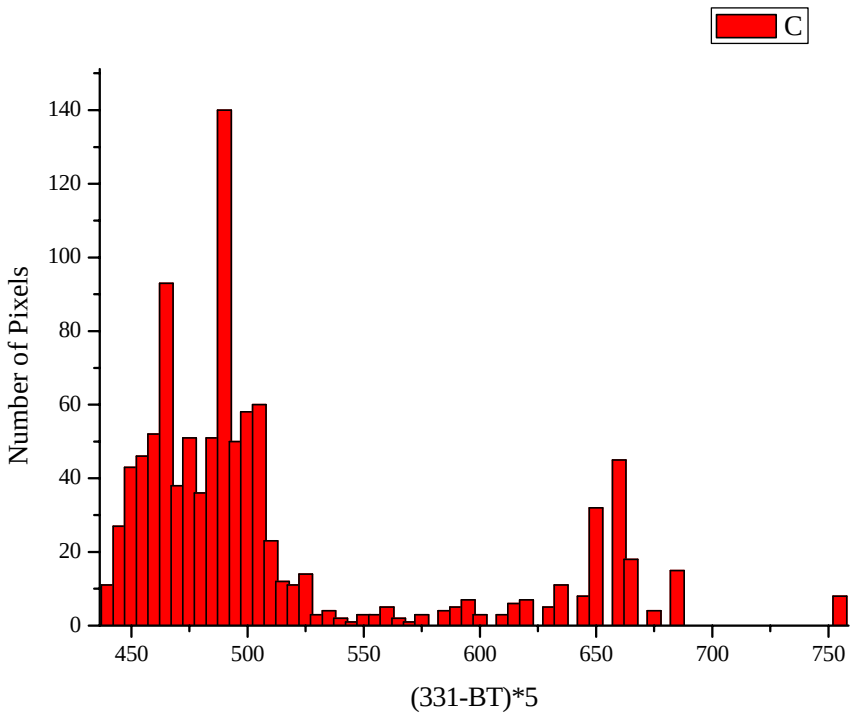


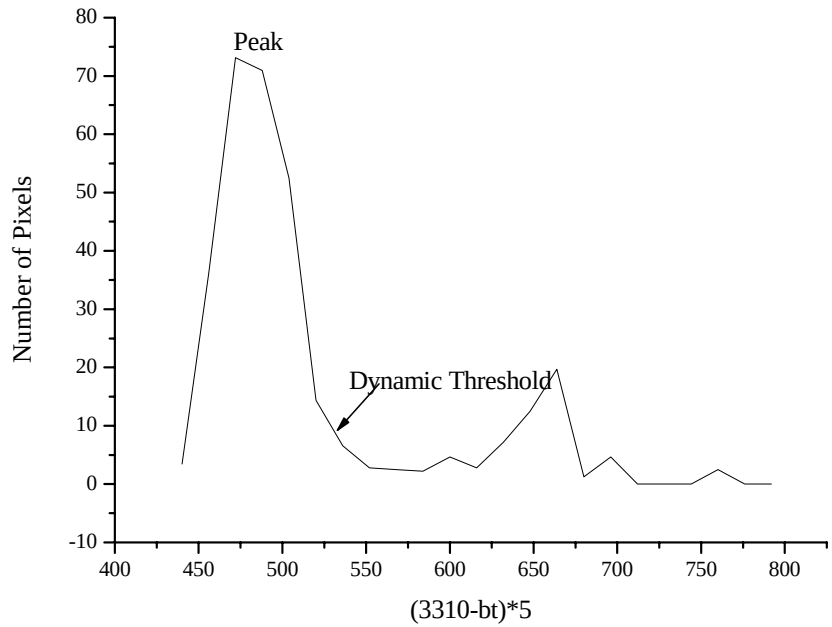
In land area, different surface elevations and land characters are separate.

Dynamic thresholds for each segment are created through three steps

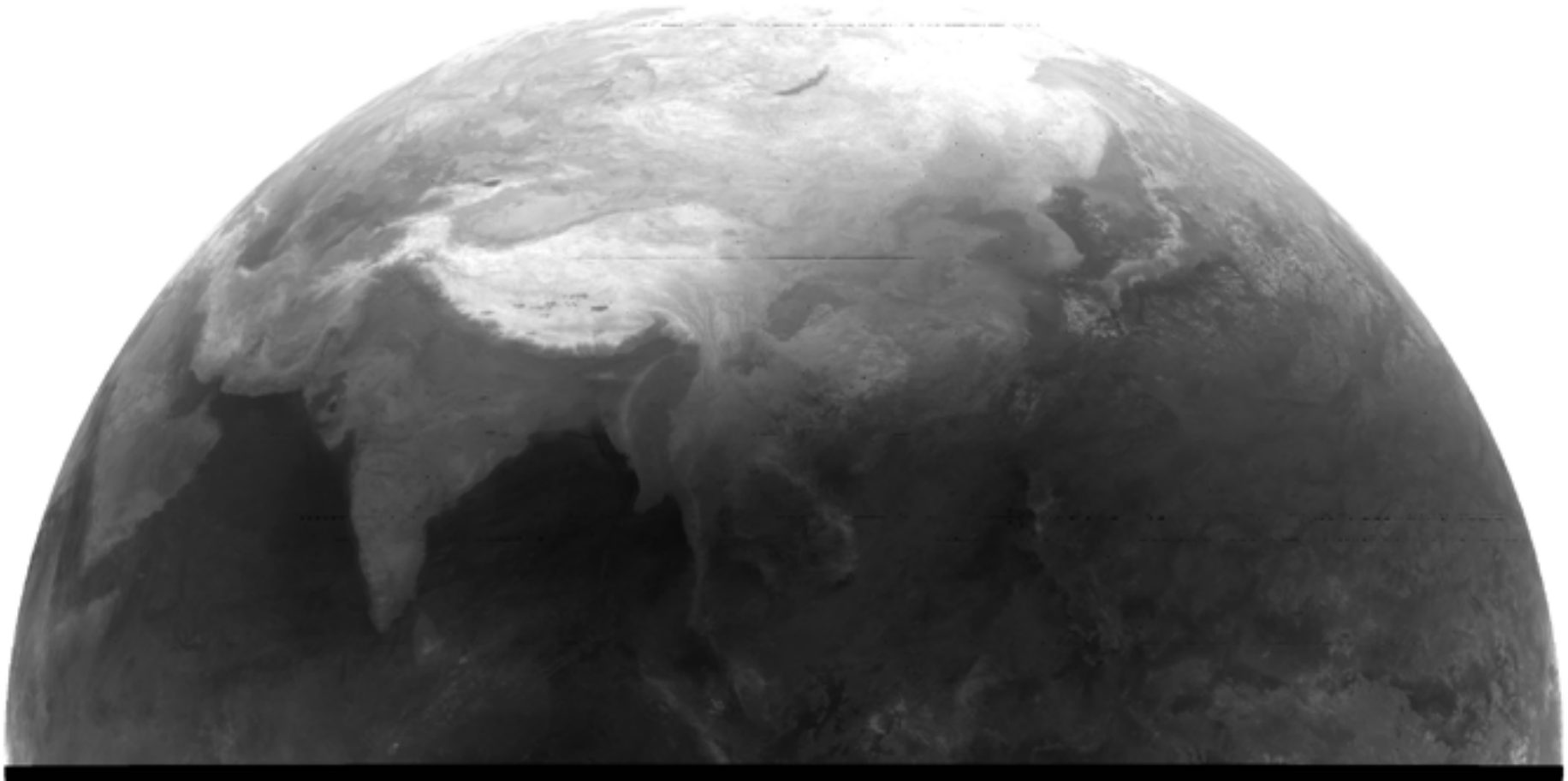
- **At first, individual image at a specific time of a day is carefully analysed to find dynamical thresholds at different channels for the day and the segment.**
- **Secondly, historical data for that time in the past 15 days is summarized to find dynamical thresholds for the segment.**
- **Thirdly, diurnal variation of the dynamical thresholds in a day for the segment is harmonized to remove and revise inappropriate values.**

After Vittorio, threshold is at the point with max slope variation (maximum scaled second derivate of histogram), rather than at the bottom of the histogram.

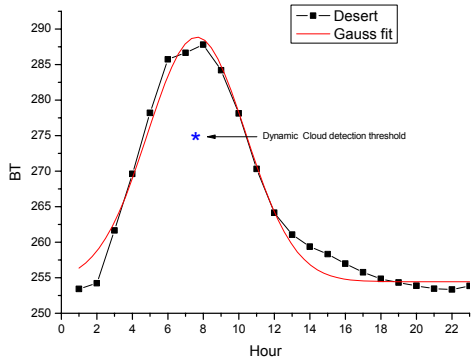


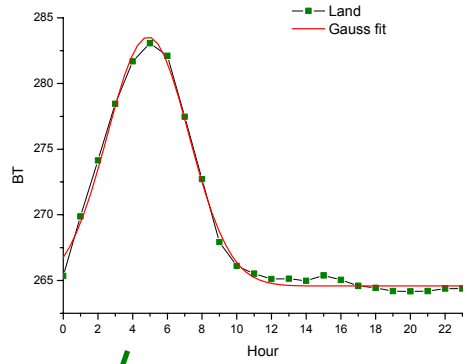


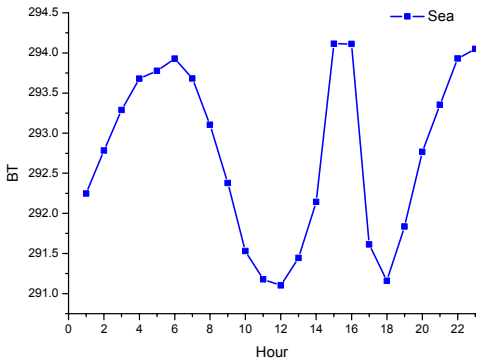
Historical data for the local time of a day in the past 15 days is summarized to find dynamical thresholds for the segment.

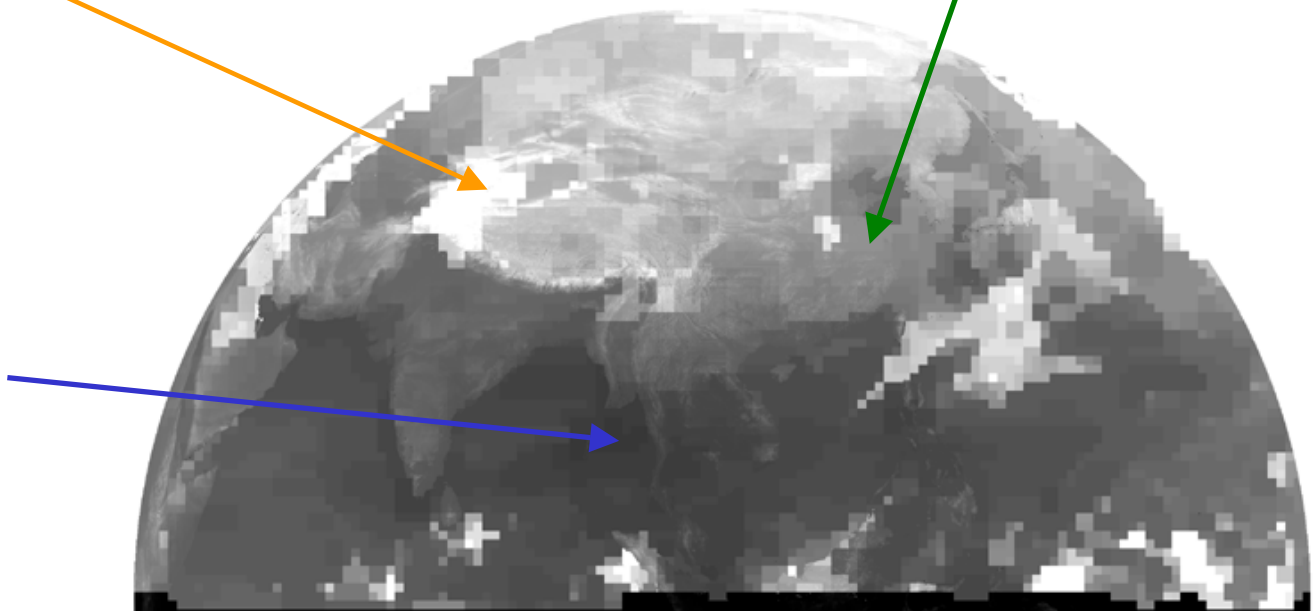


Diurnal variation of the dynamical thresholds in a day is harmonized to remove inappropriate values.





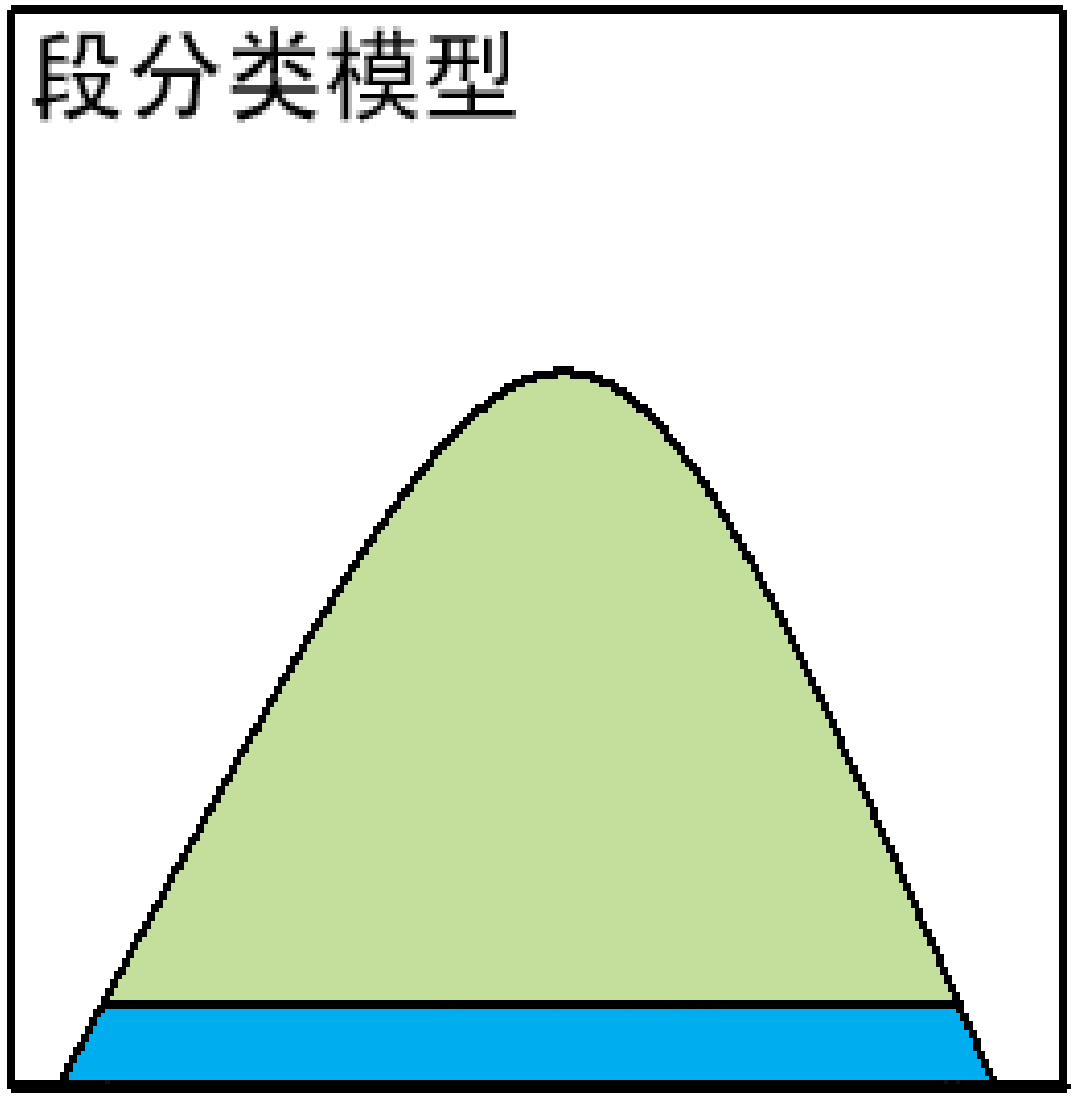




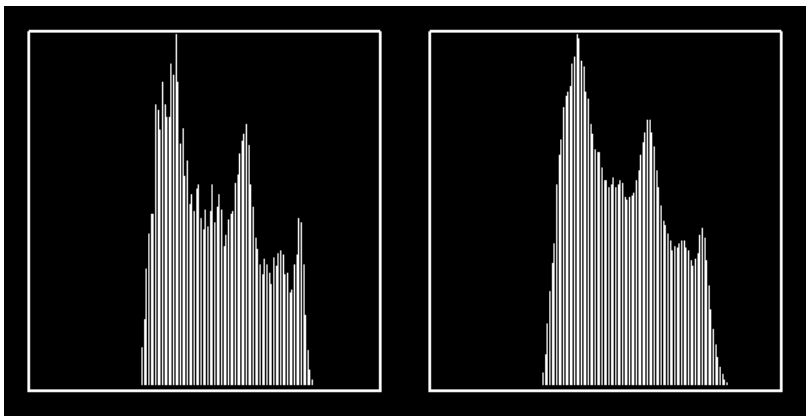
Cloud classification mainly depends on IR/WV scatter diagram analysis. It is complementary with histogram and deviation analysis

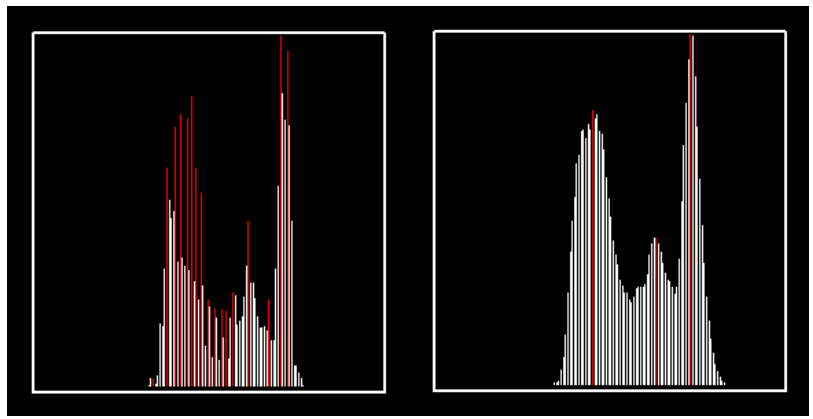
- Groups from histogram and deviation analysis are tested at the IR/WV scatter diagrams.
- The groups with most steep slopes are Cb cloud and dense cirrus cloud. Cb cloud is characterized with close or even negative WV-IR differences.
- The groups with most flat slopes are As or Ns clouds.
- The thin cirrus is characterized with slope between the above two groups.

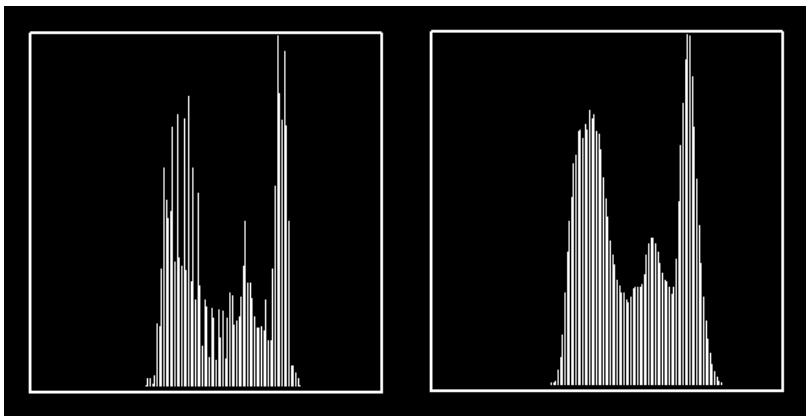
Histogram is performed for uniform pixels

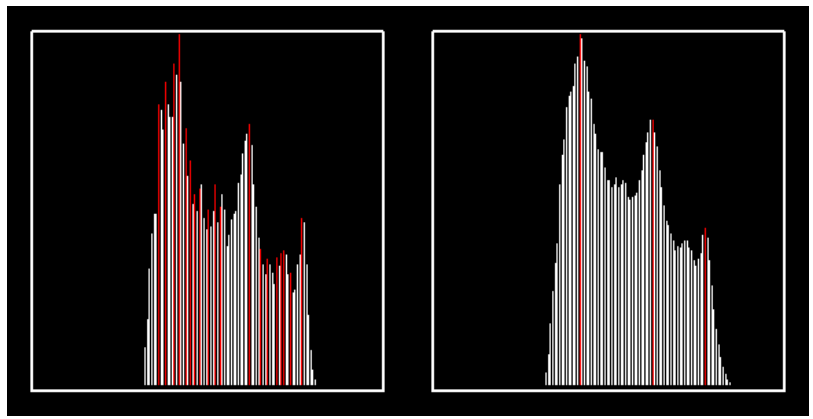


Histogram Analysis

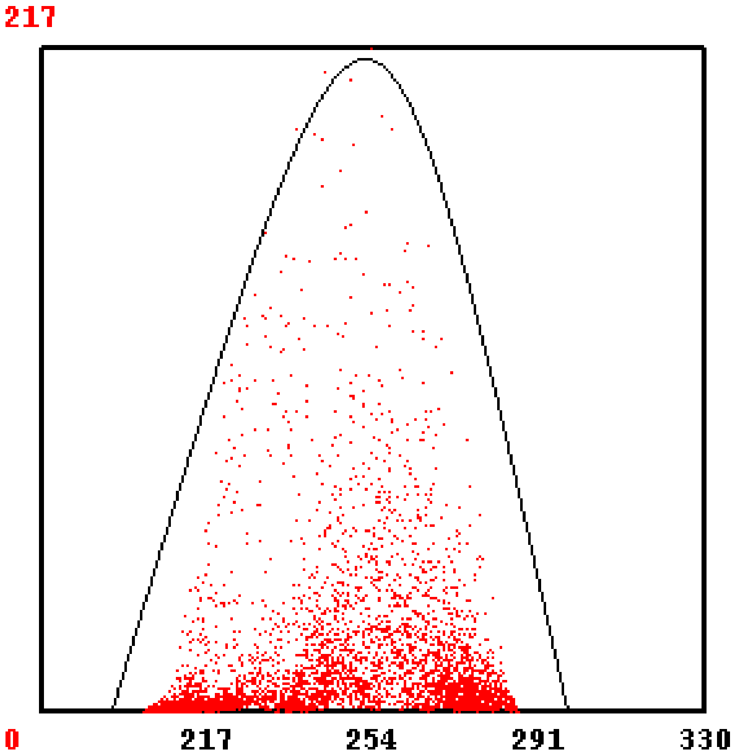


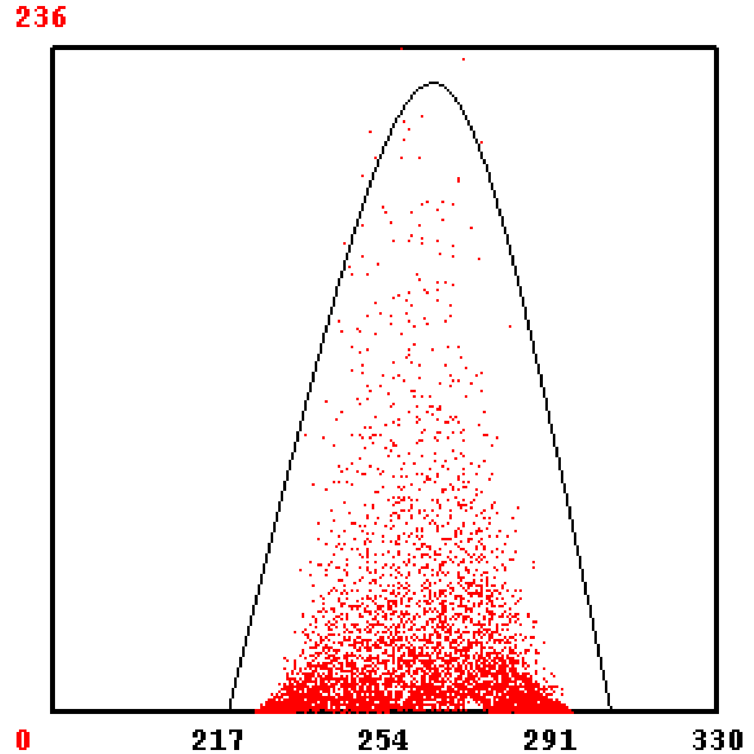






Upper part at deviation analysis are mixing pixels





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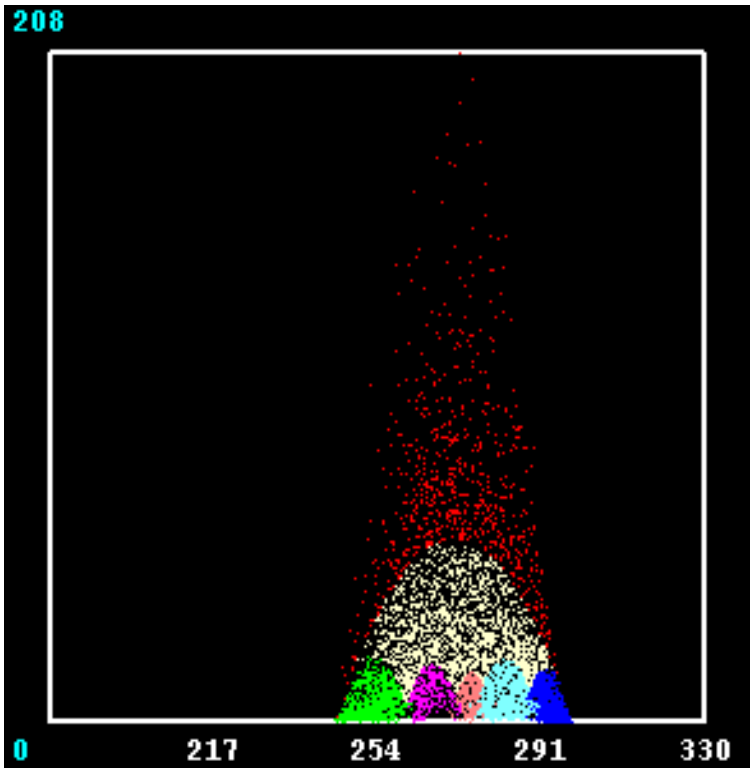
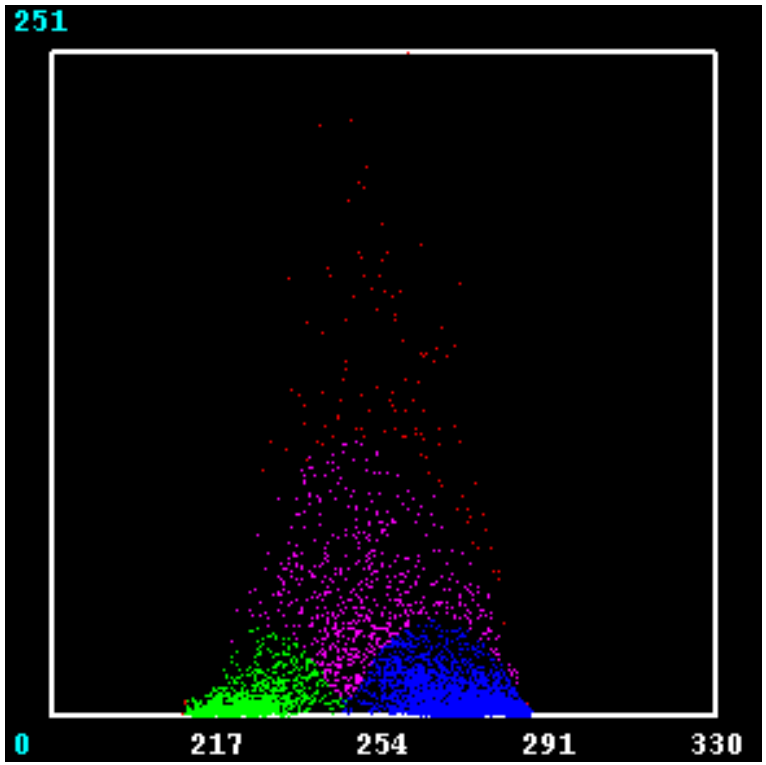
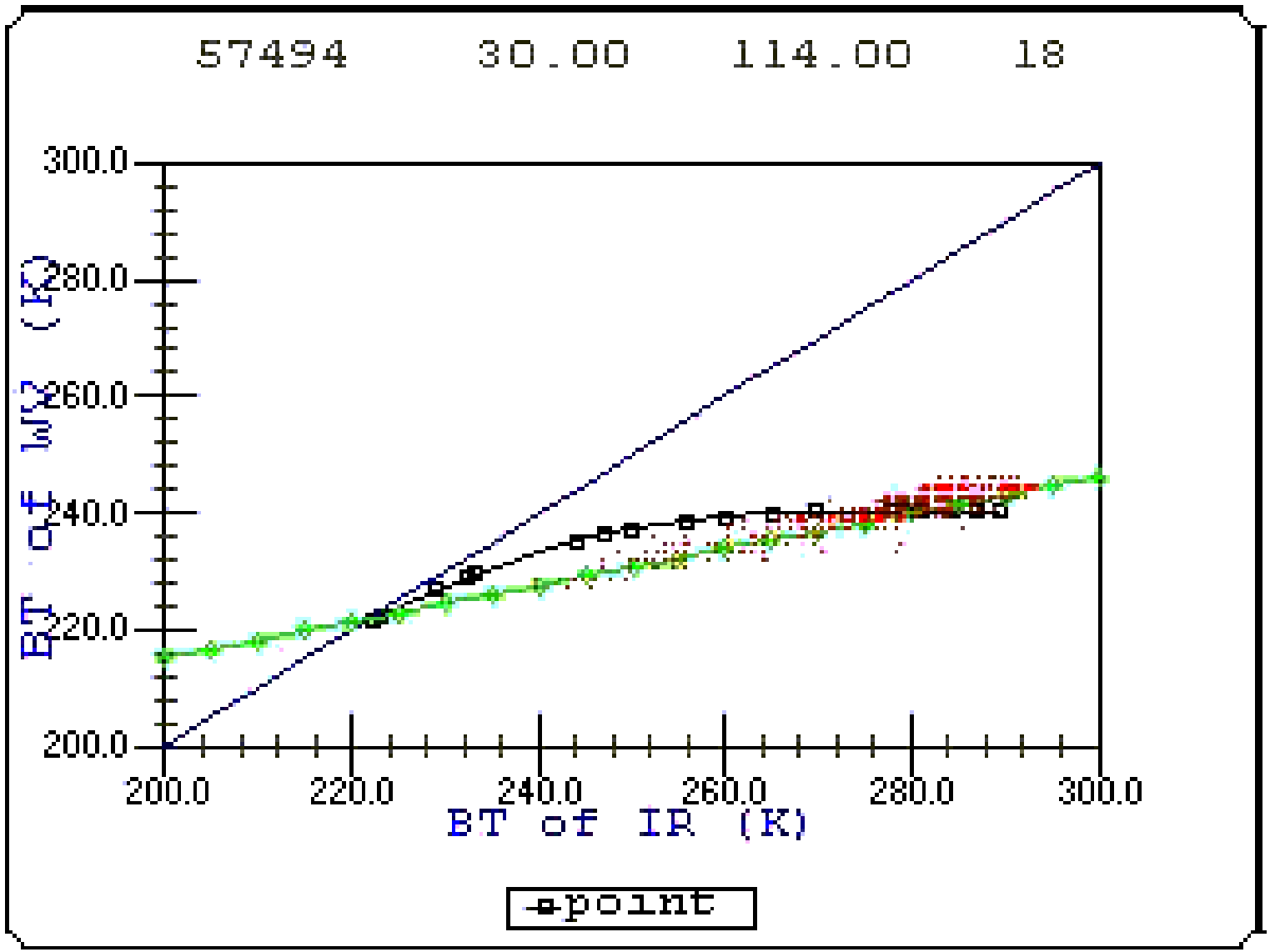
With histogram and deviation analysis, several groups are gain

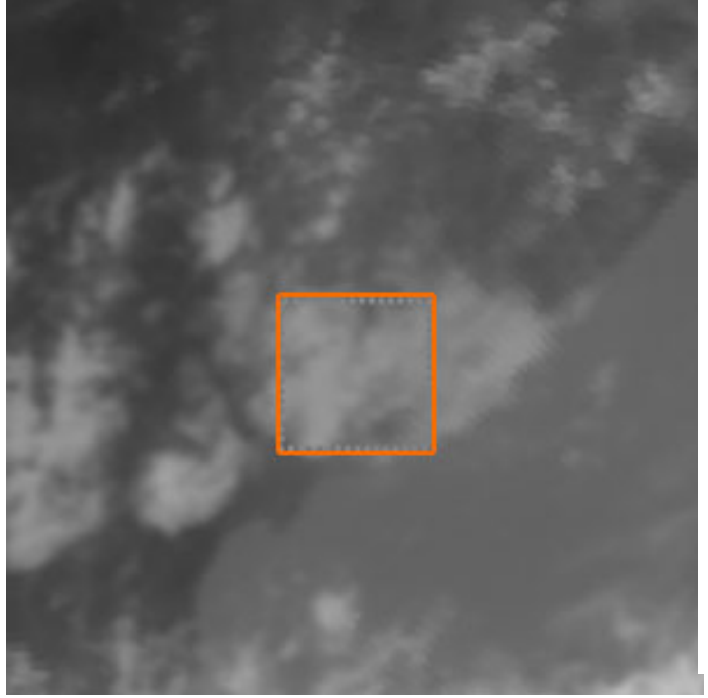


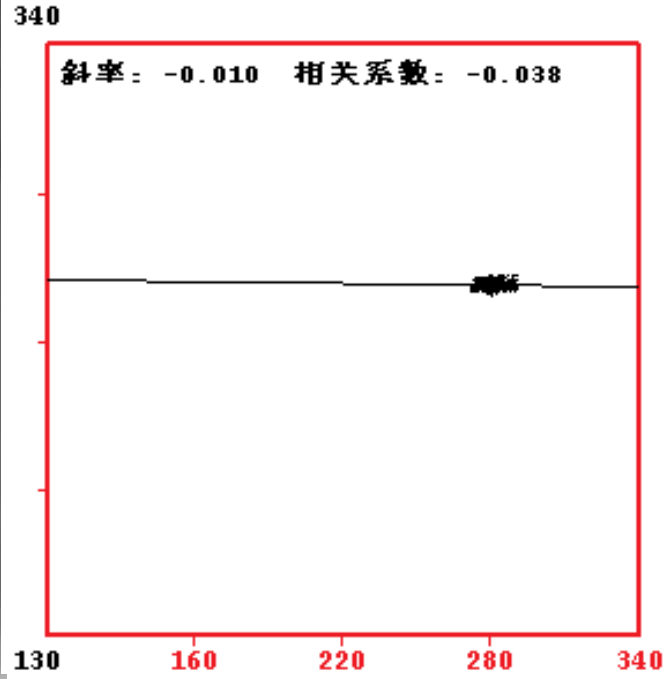


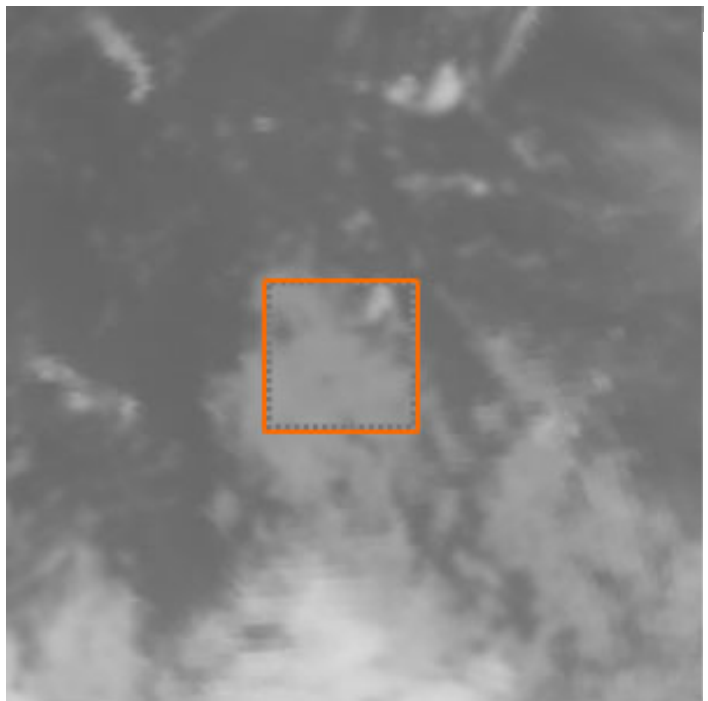
Groups from histogram and deviation analysis are tested at the IR/WV scatter diagrams

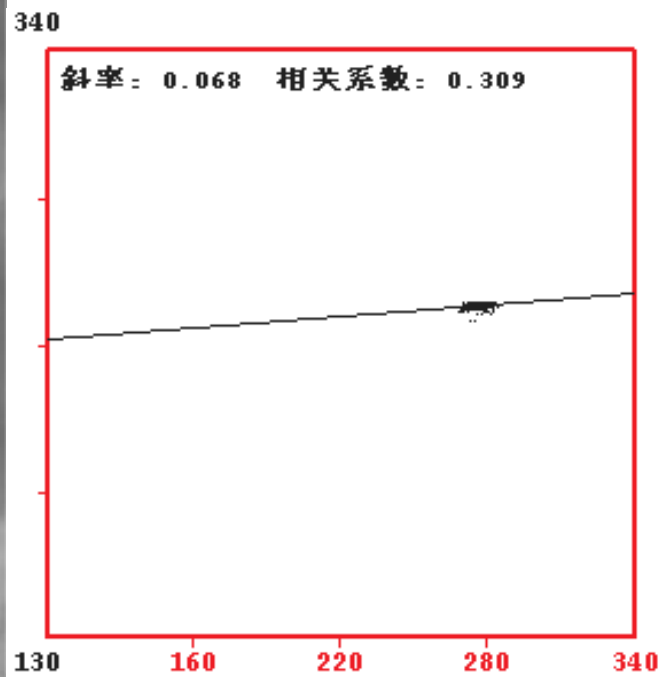


Medium cloud is associated with flat sloop

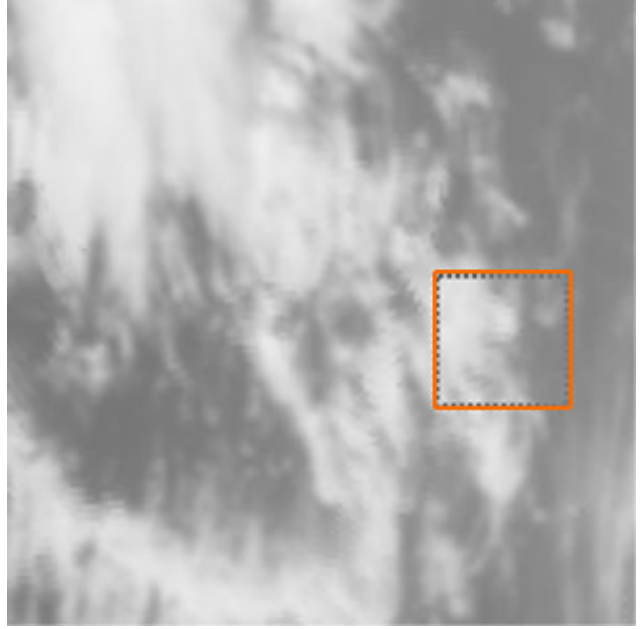


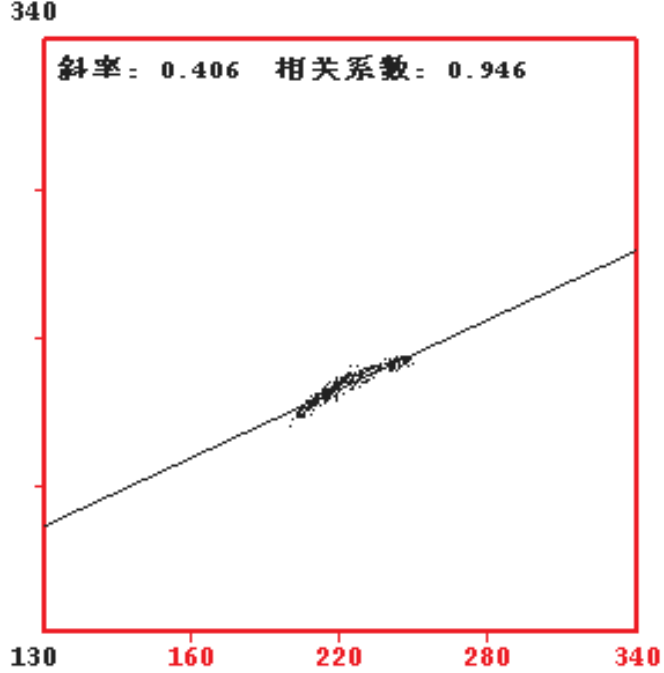


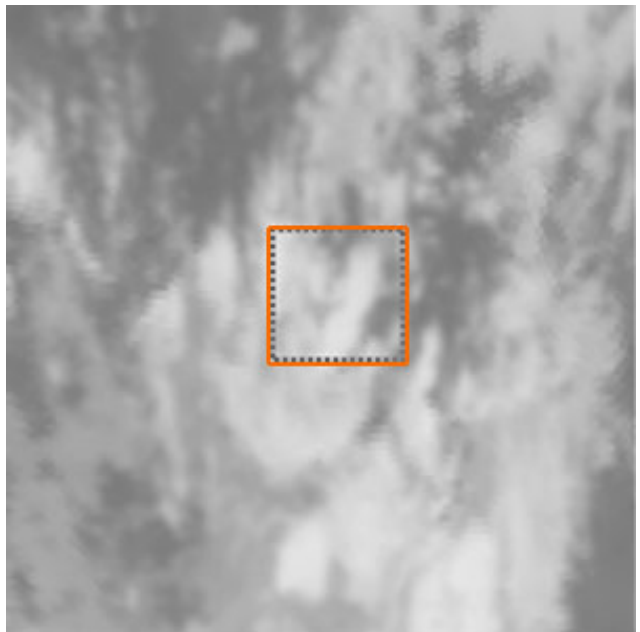


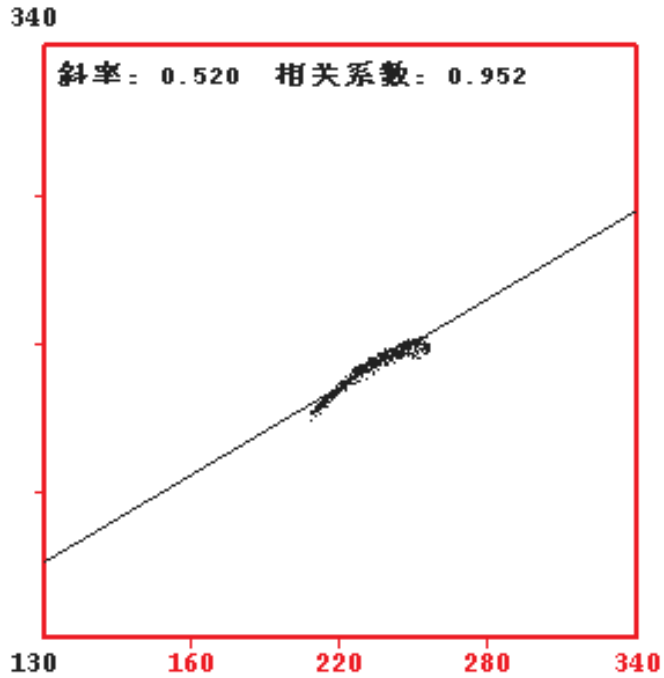


Thin cirrus cloud is associated with middle sloop

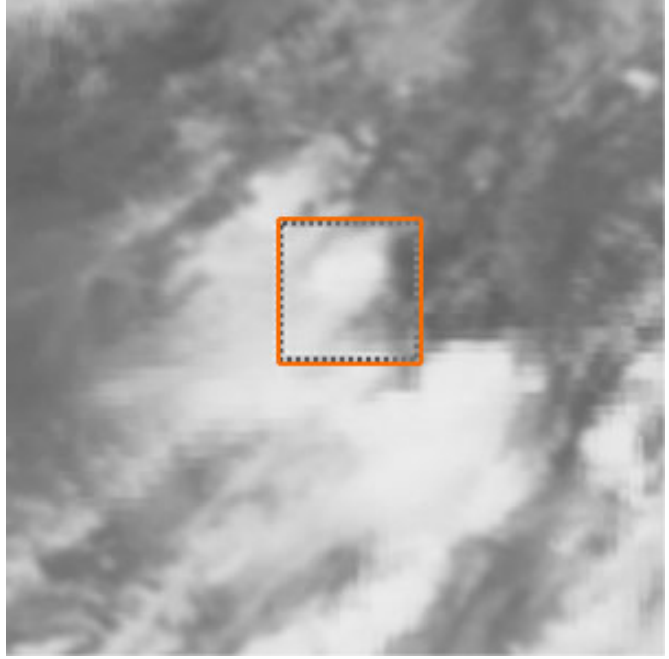


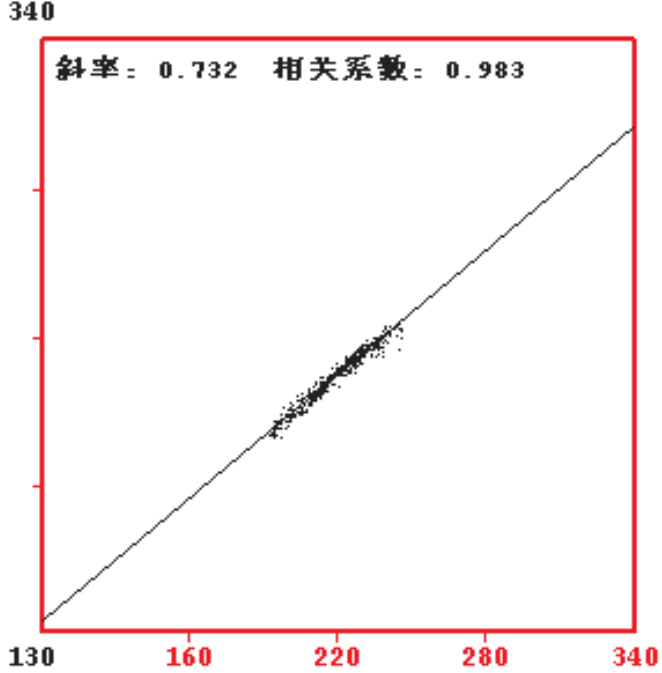


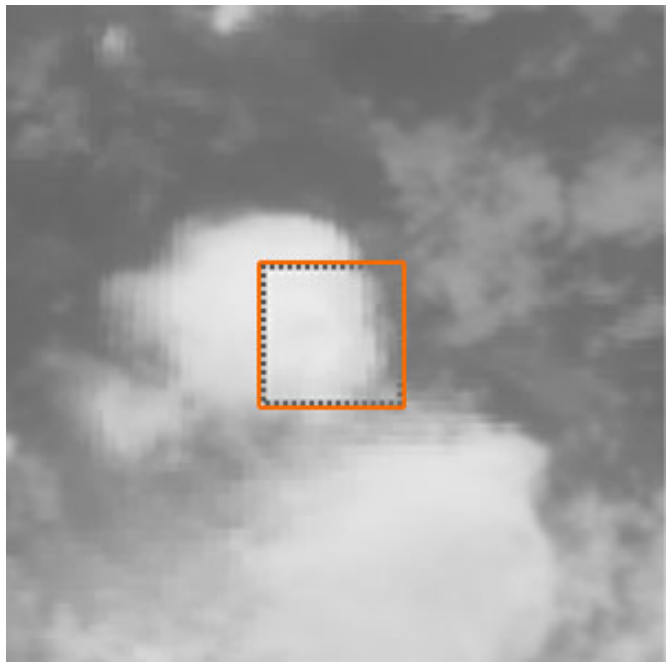


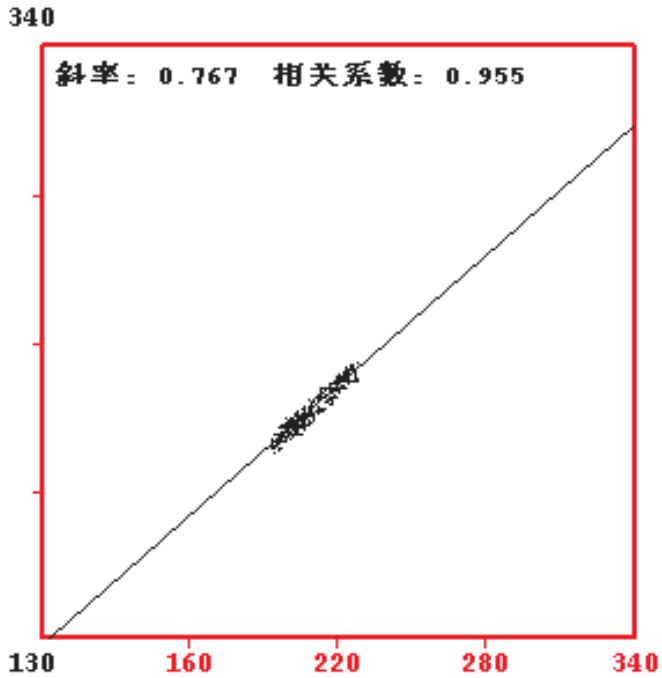


Cb or Thik cirrus cloud is associated with steep sloop









Cloud Classification

- Cb cloud or Dense cirrus cloud The groups with most steep slopes are Cb cloud or dense cirrus cloud. Cb cloud is characterized with close or even negative WV-IR differences, while Dense cirrus cloud is not.
- The groups with most flat slopes are As or Ns clouds.
- The thin cirrus is characterized with slope between the above two groups.
- Upper part at deviation analysis are mixing pixels.
- Pixels detected as cloud in cloud detection step, but not detected as high cloud in high cloud detection step are grouped as low cloud (stratus or cumulus).
- Pixels detected as surface in cloud detection step are surface.

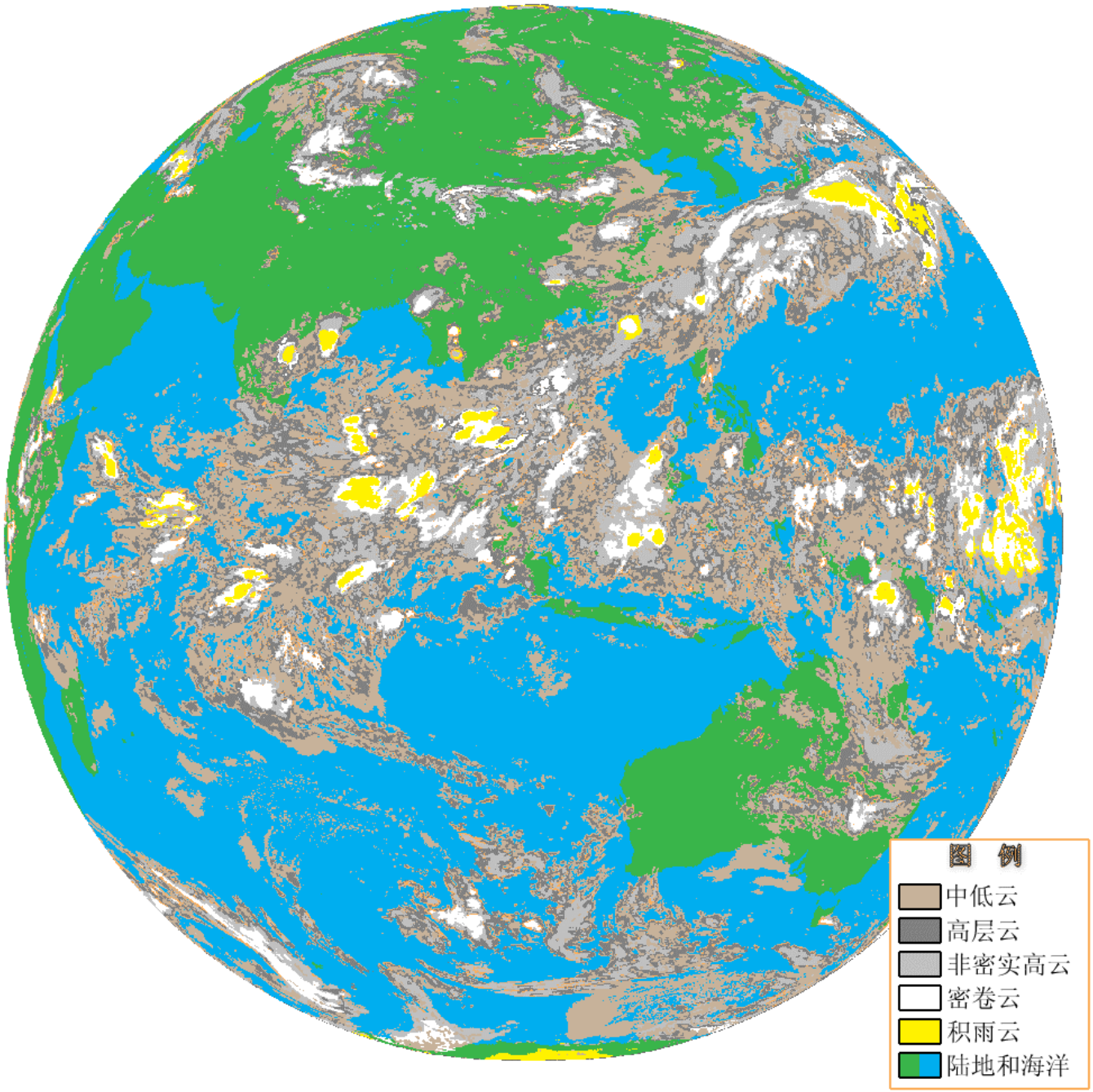
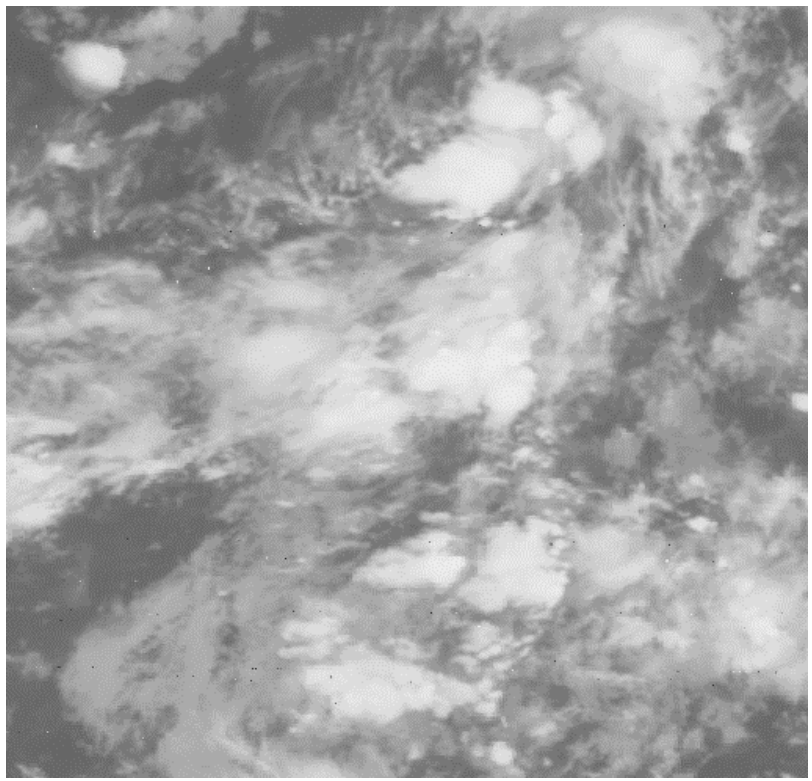
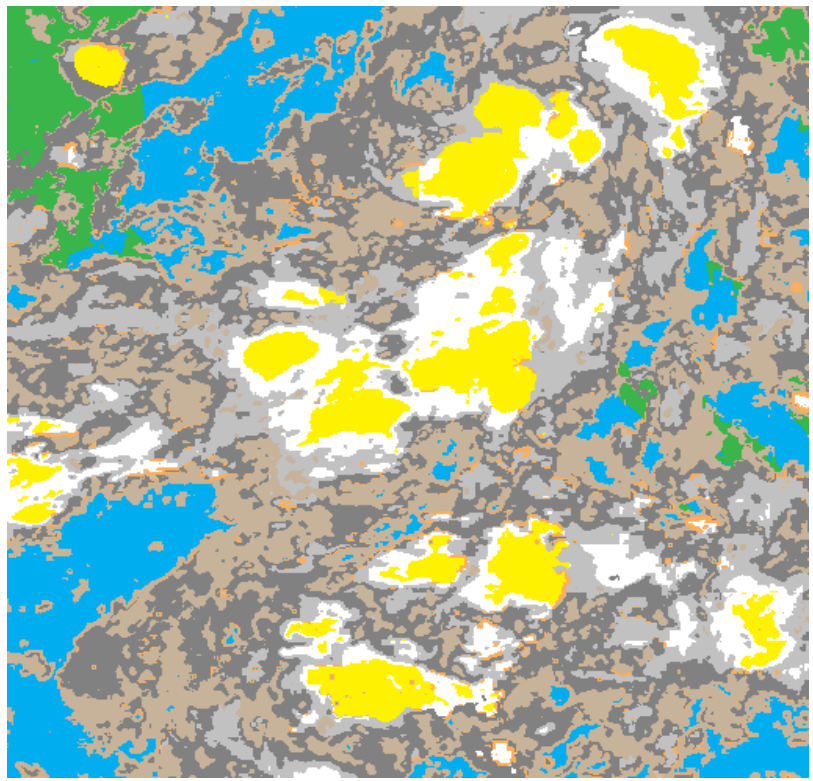


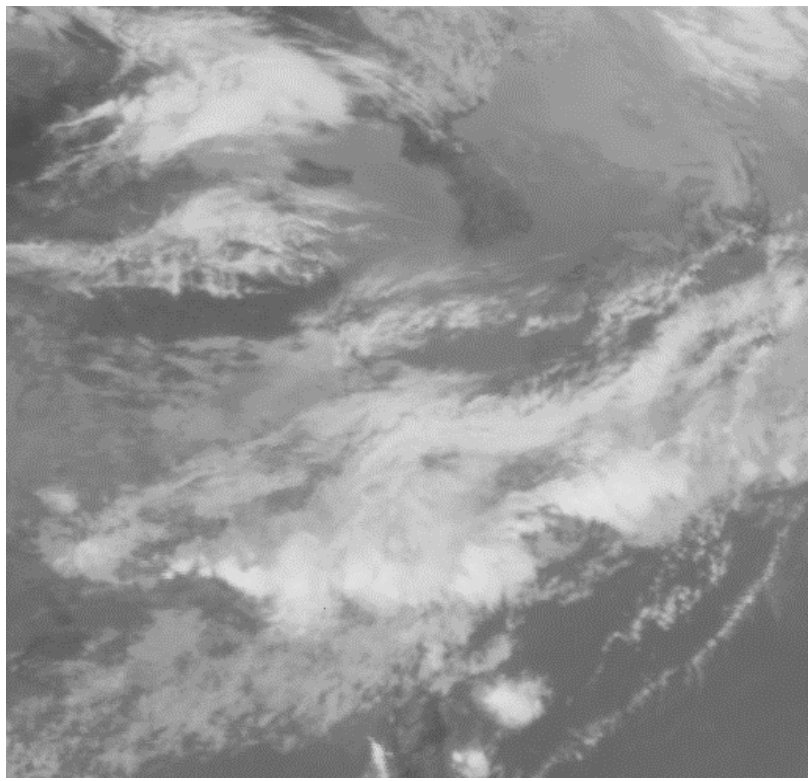
图 例
中低云
高层云
非密实高云
密卷云
积雨云
陆地和海洋

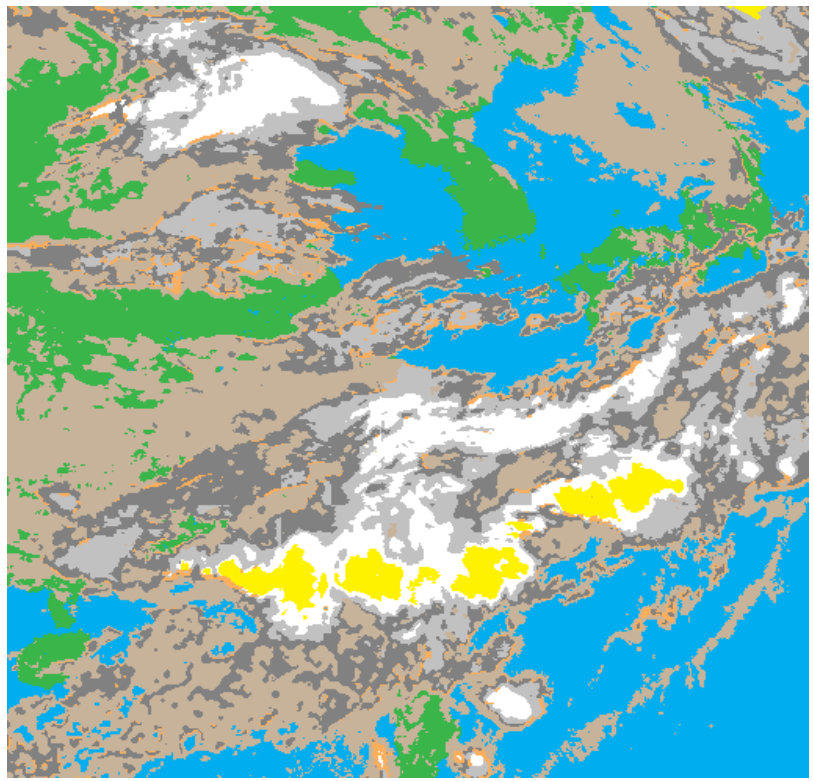
IR image and cloud classification





IR image and cloud classification





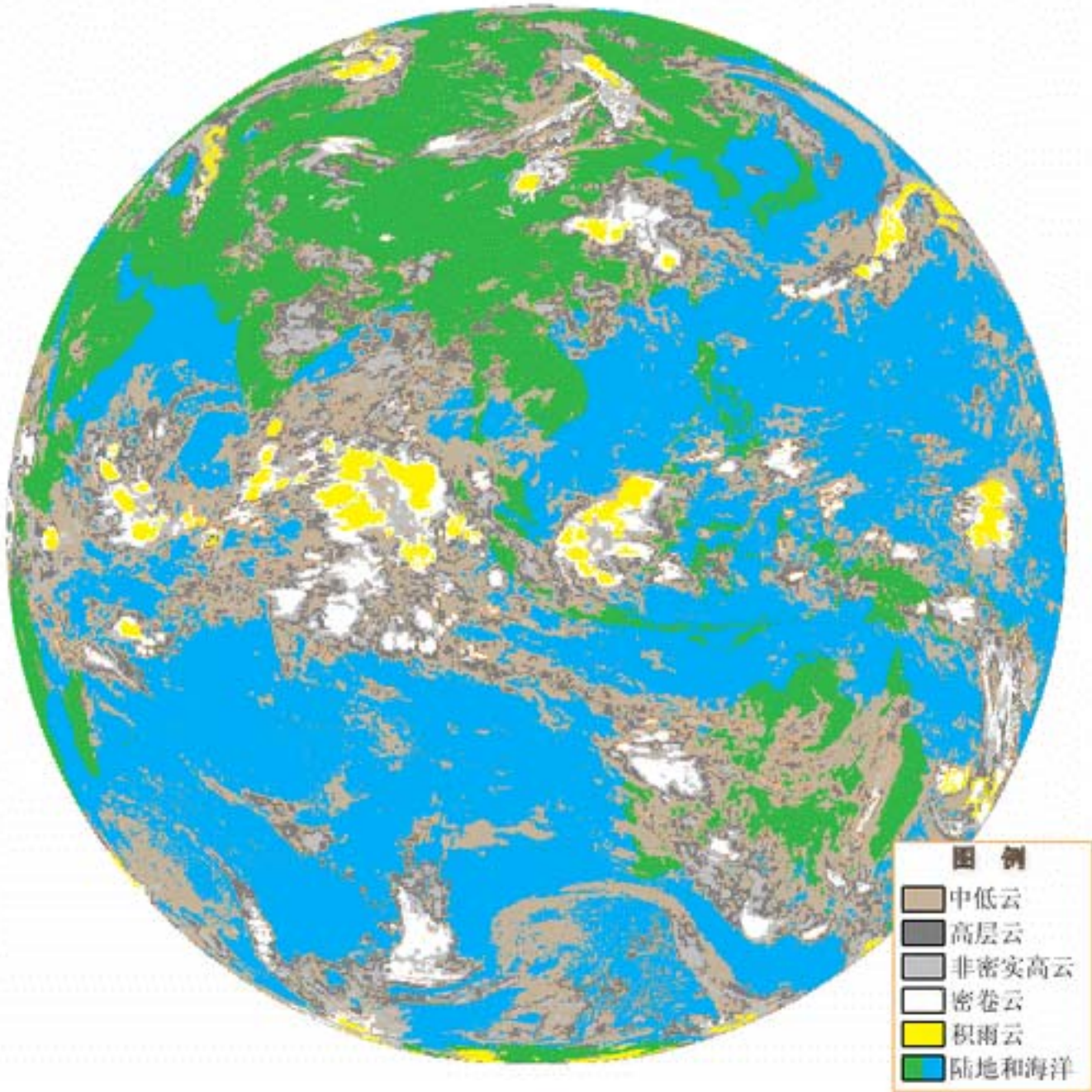
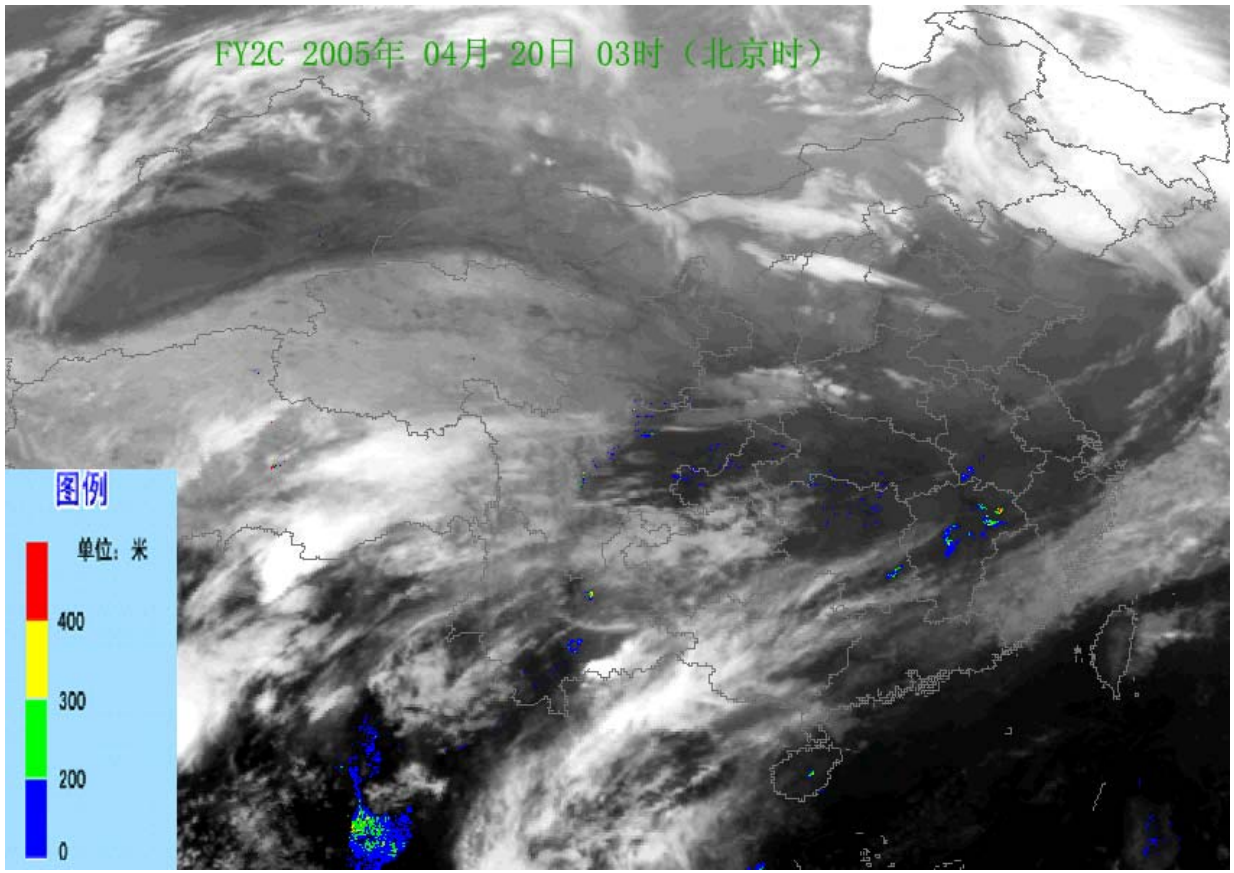
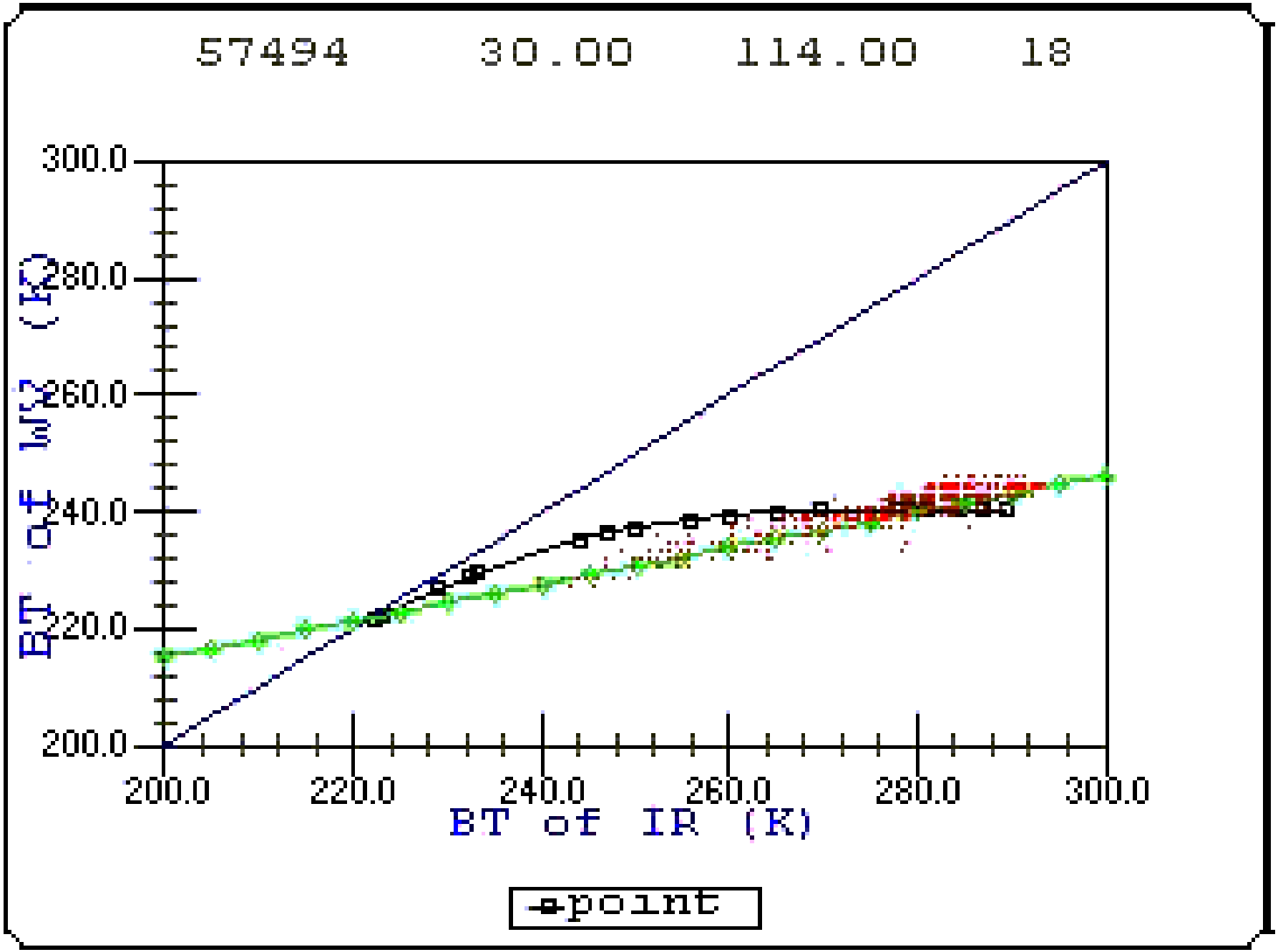


图 例
中低云
高层云
非密实高云
密卷云
积雨云
陆地和海洋

FY2C Fog



Atmospheric motion vectors


57494 30.00 114.00 18
300.0
280.0
260.0
240.0
220.0
200.0
BT of WV (K)
200.0
220.0
240.0
260.0
280.0
300.0
BT of IR (K)
point

原订证温度 224.52 该处斜率 .30

订证之前温度 248.96

行= 13 列= 15

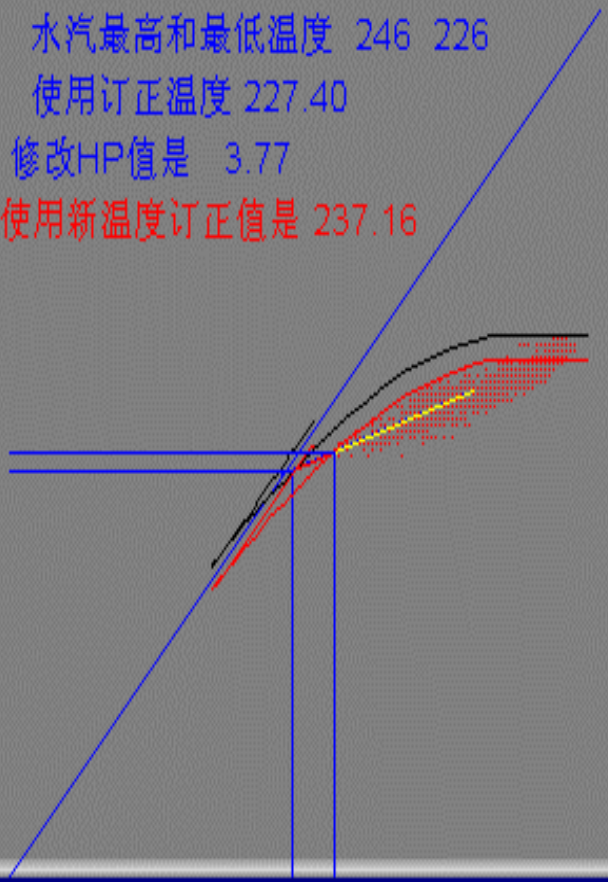
红外最高和最低温度 294 236

水汽最高和最低温度 246 226

使用订正温度 227.40

修改HP值是 3.77

使用新温度订正值是 237.16



相交的点号为26

相交处IR温度 227.40

相交处WV温度 225.39

相交的点号为28

相交处IR温度 237.16

相交处WV温度 228.34

点击这里返回

HP	IR	WV	HP	IR	WV
1.09	232.40	233.46	200.99	218.64	218.72
1.72	232.14	233.20	223.43	221.96	221.32
2.68	231.73	232.79	247.38	225.51	223.98
5.95	230.33	231.39	272.89	230.14	227.43
8.34	229.31	230.37	300.00	235.17	230.84
11.61	227.91	228.97	328.68	239.99	233.88
13.80	226.97	228.03	358.99	245.08	236.70
15.53	226.23	227.28	390.85	250.42	239.52
21.00	223.89	224.94	424.39	254.97	241.65
24.31	222.48	223.59	459.64	259.29	243.14
29.13	220.43	221.55	496.64	263.78	244.63
35.65	217.63	218.84	535.24	267.38	245.61
43.10	214.45	215.75	575.55	270.84	246.44
51.52	211.25	212.71	617.48	274.42	247.26
60.99	209.74	211.33	661.19	277.88	247.26
71.54	208.28	210.00	706.57	281.37	247.26
83.23	208.18	209.92	753.60	285.25	247.26
96.12	208.06	209.80	802.34	288.95	247.26
110.26	209.53	211.11	852.77	292.44	247.26
125.64	211.77	213.05	904.82	294.77	247.26
142.39	214.22	215.17	958.30	297.13	247.26
160.49	216.00	216.72			
180.01	217.23	217.65			

原订证温度 227.52 该处斜率 .37

订证之前温度 227.84

行= 44 列= 20

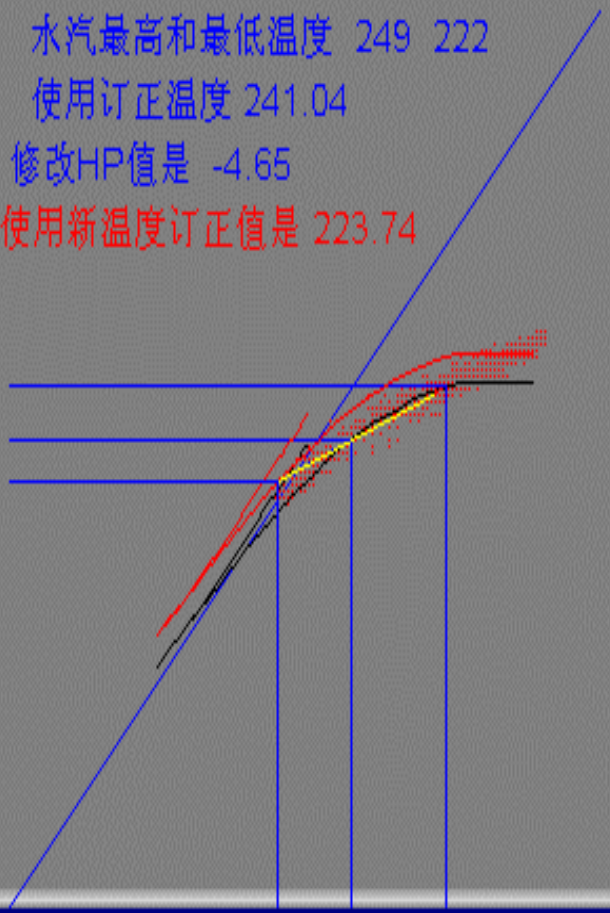
红外最高和最低温度 286 222

水汽最高和最低温度 249 222

使用订正温度 241.04

修改HP值是 -4.65

使用新温度订正值是 223.74



相交的点号为27

相交处IR温度 241.04

相交处WV温度 232.54

相交的点号为33

相交处IR温度 264.00

相交处WV温度 241.08

相交的点号为24

相交处IR温度 223.74

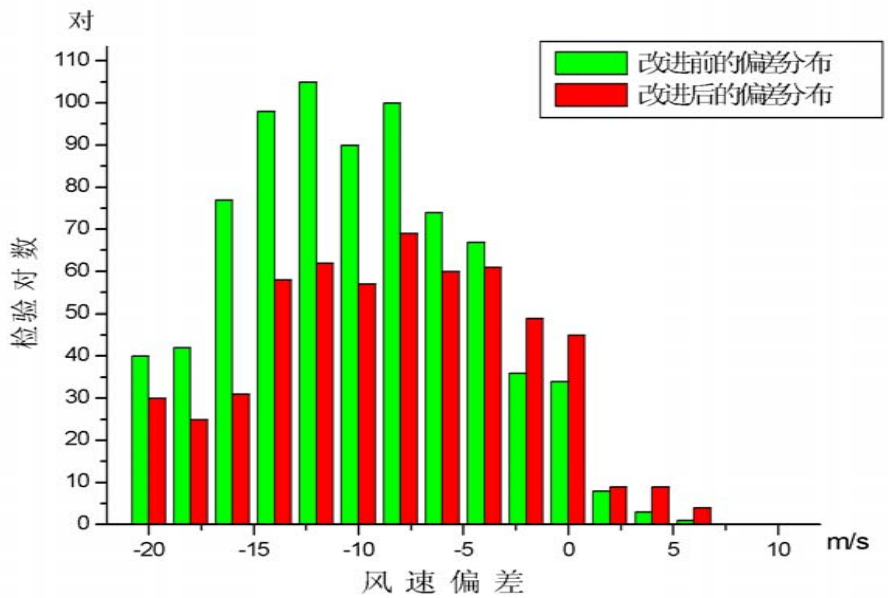
相交处WV温度 226.11

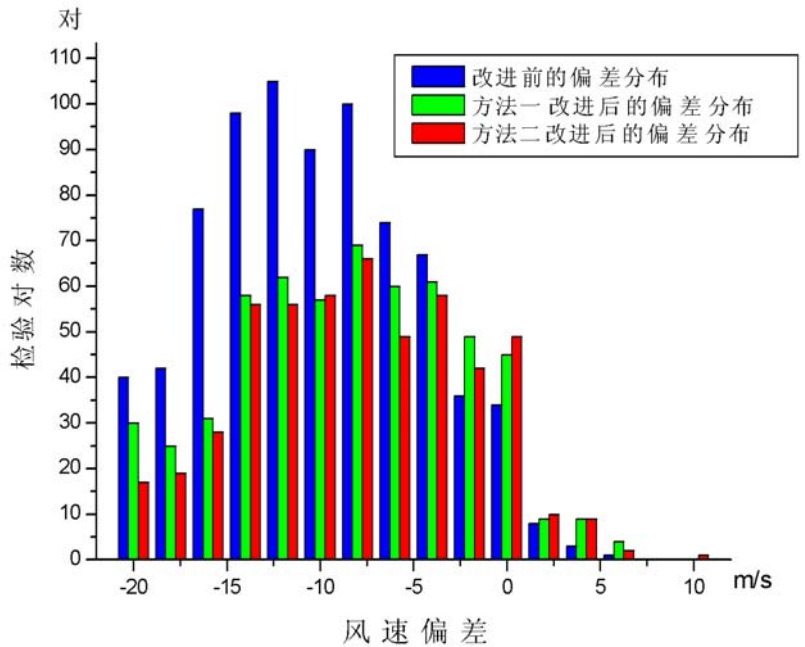
点击这里返回

HP	IR	WV	HP	IR	WV
1.09	231.26	232.32	200.99	221.71	219.97
1.72	230.93	232.00	223.43	226.72	223.67
2.68	230.44	231.50	247.38	232.06	227.30
5.95	228.75	229.82	272.89	237.38	230.60
8.34	227.52	228.59	300.00	242.99	233.58
11.61	225.83	226.90	328.68	247.19	235.63
13.80	224.70	225.77	358.99	251.58	237.40
15.53	223.81	224.88	390.85	256.15	239.02
21.00	220.99	222.06	424.39	259.97	240.27
24.31	219.28	220.39	459.64	263.41	240.97
29.13	216.80	217.92	496.64	266.90	241.60
35.65	213.65	214.83	535.24	269.22	241.60
43.10	210.08	211.34	575.55	271.30	241.60
51.52	206.07	207.49	617.48	273.61	241.60
60.99	201.62	203.29	661.19	275.85	241.60
71.54	197.26	199.26	706.57	278.00	241.60
83.23	196.31	198.41	753.60	279.68	241.60
96.12	195.26	197.45	802.34	280.98	241.60
110.26	197.44	199.38	852.77	282.31	241.60
125.64	201.19	202.64	904.82	282.91	241.60
142.39	205.27	206.22	958.30	284.19	241.60
160.49	210.14	210.48			
180.01	215.75	215.13			

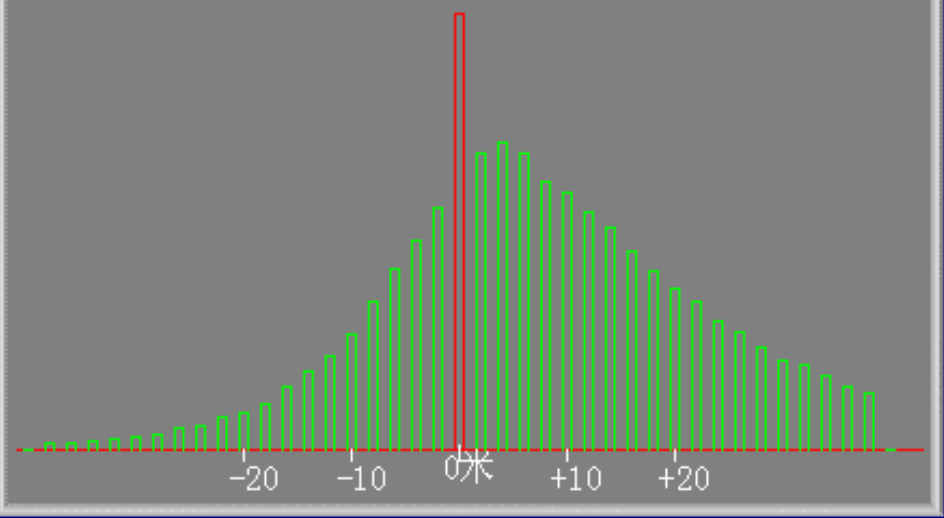
With GMS data 28-31 May 2003□after radiation calculation □ mean absolute difference is reduced from 13.80 m/s to 11.88 m/s□RMS from 16.09 m/s to 14.60 m/s□

With GMS data 28-31May2003□ after radiation curve adjusted mean absolute difference is reduced from 11.88 m/s to 11.07 m/s□RMS from 14.6 m/s to 13.64m/s□

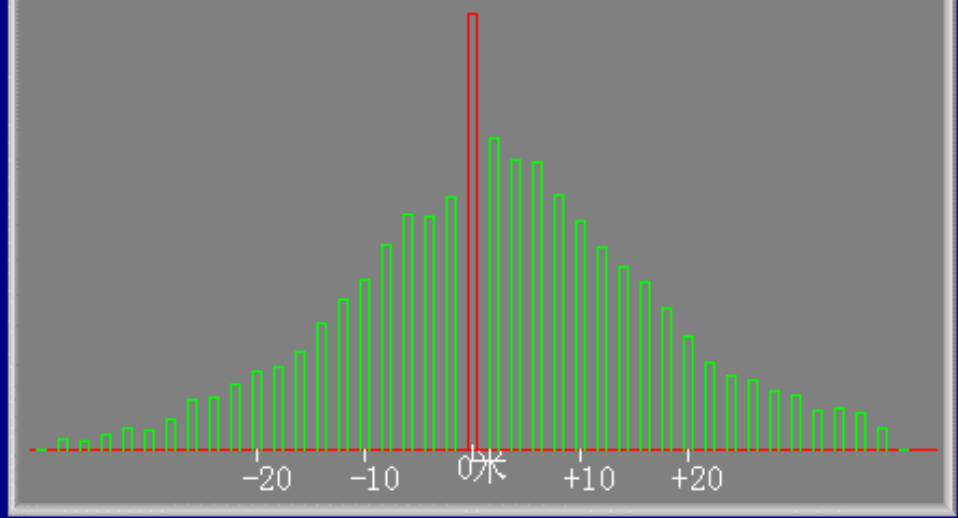




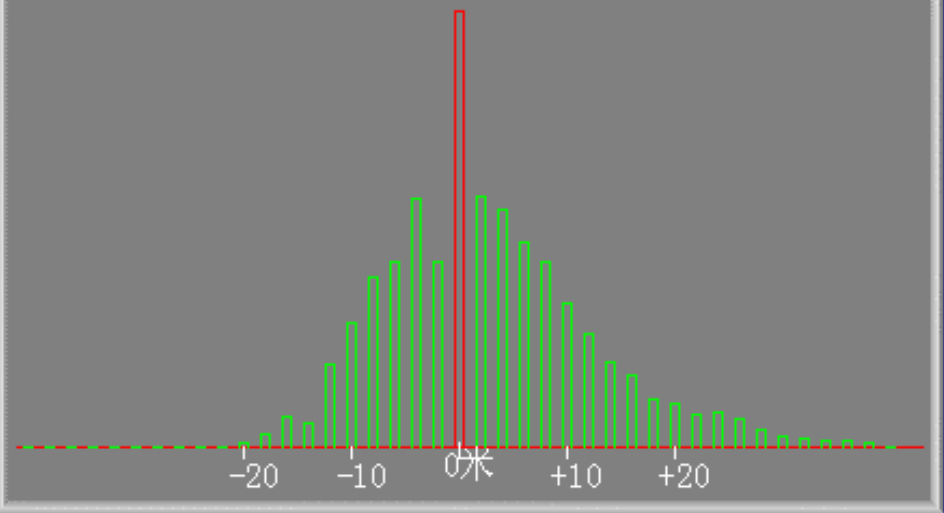
云导风高层风与探空资料风均方差为 15.752730
云导风高层风与探空资料风绝对值差为 12.258380
云导风高层风与探空资料风平均误差为 6.858512
高层风与探空资料风样本数 172354

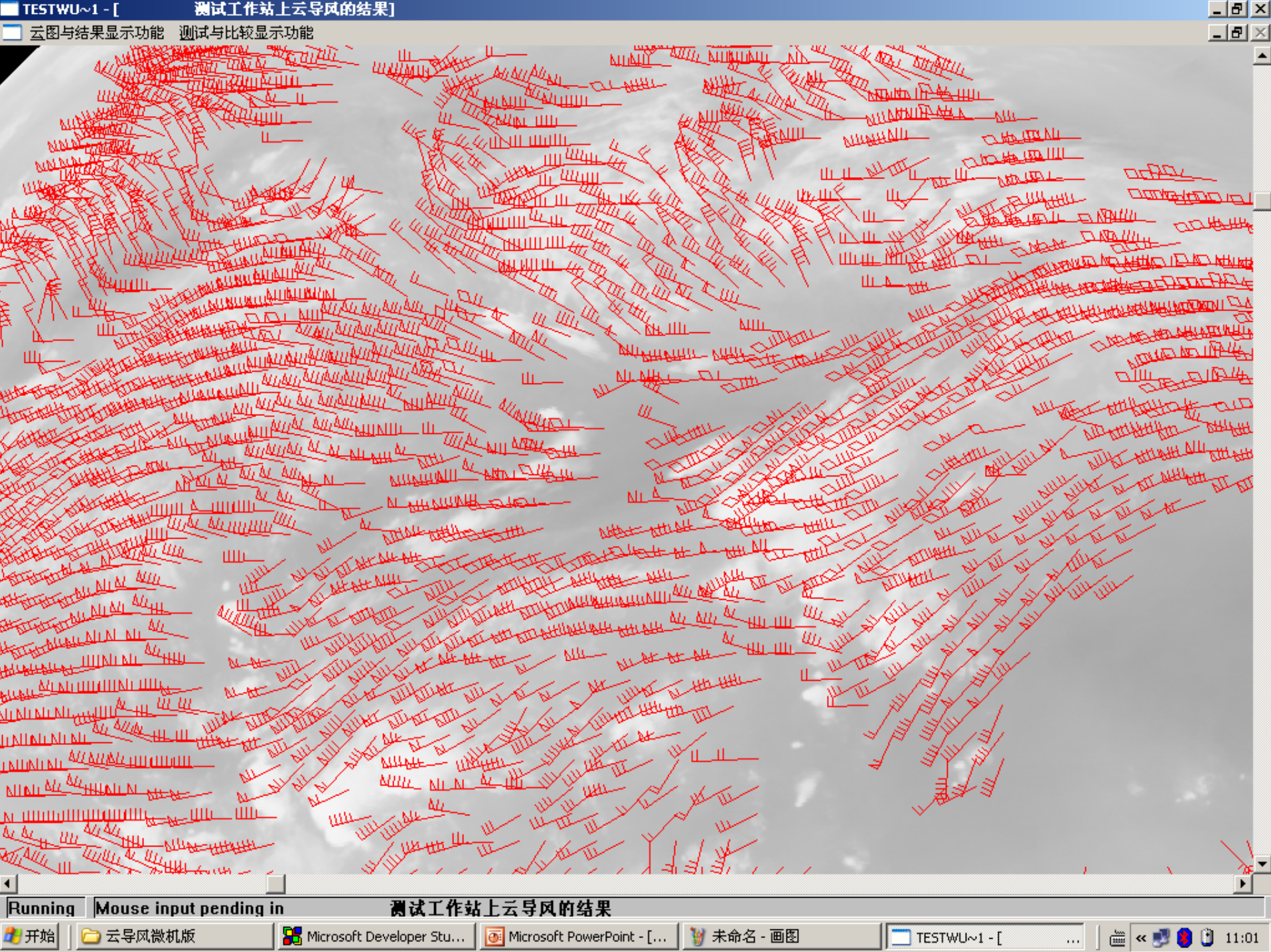


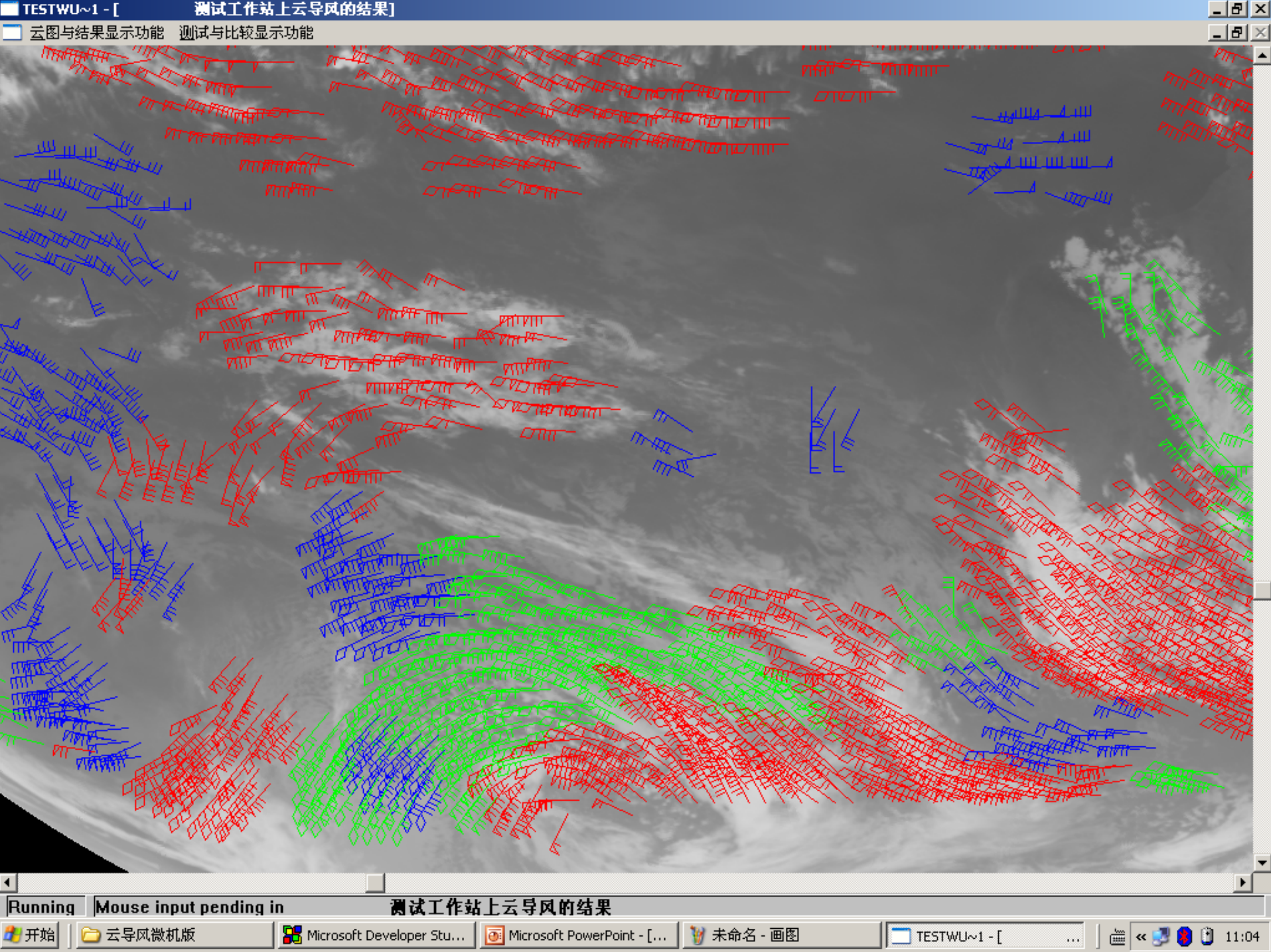
云导风中层风与探空资料风均方差为 14.382170
云导风中层风与探空资料风绝对值差为 11.181310
云导风中层风与探空资料风平均误差为 2.394216
中层风与探空资料风样本数 17980

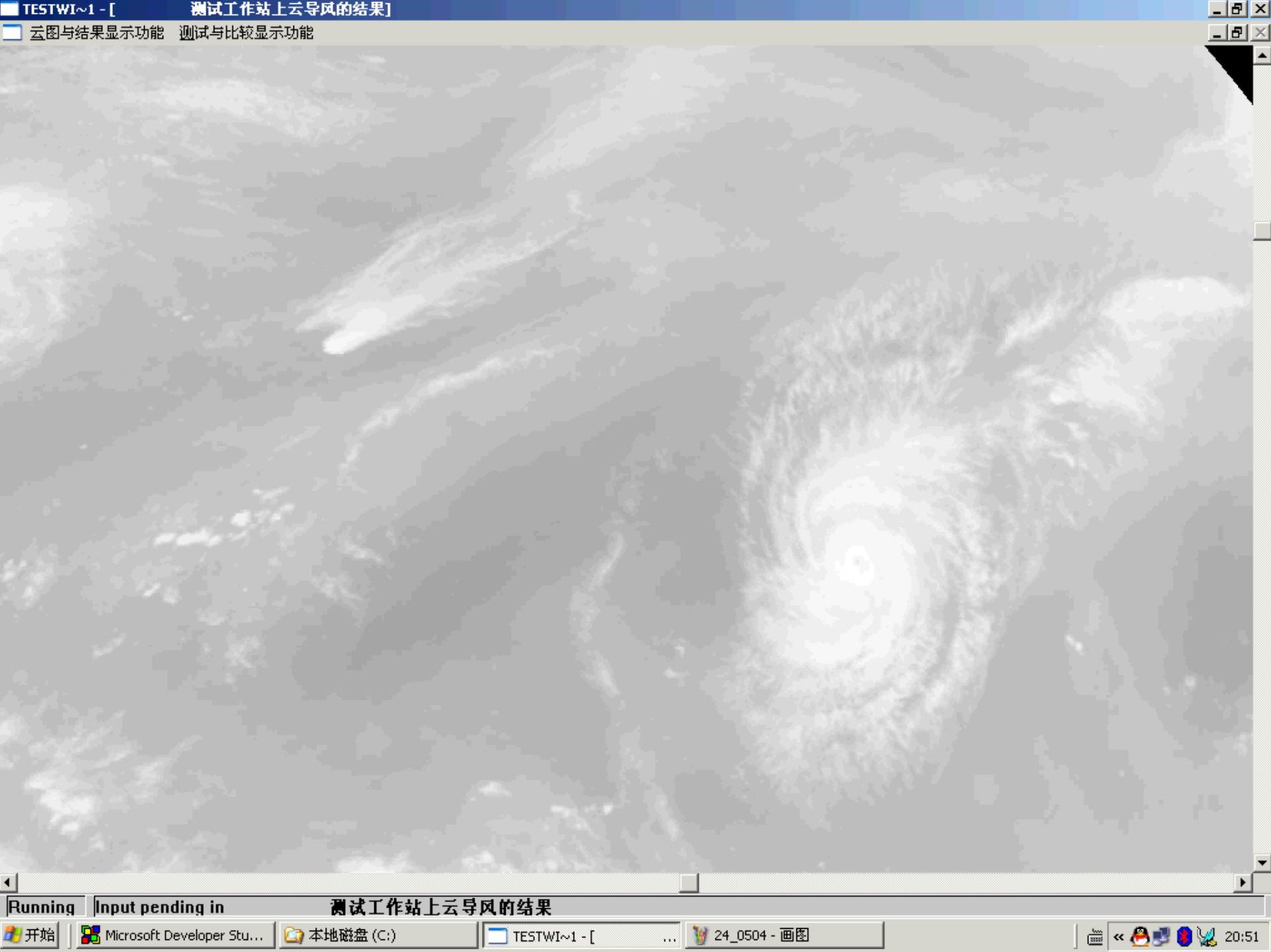


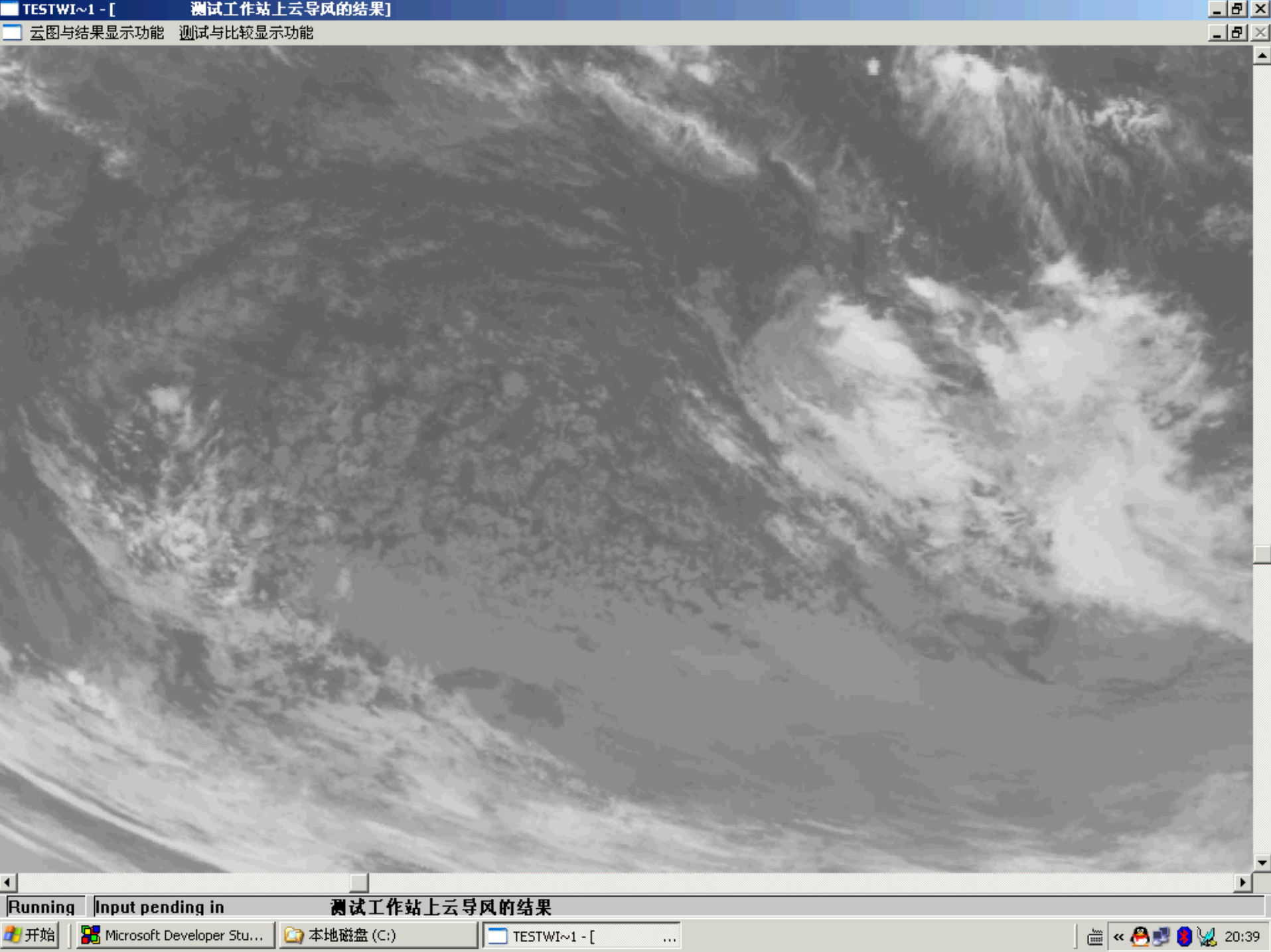
云导风低层风与探空资料风均方差为 10.125030
云导风低层风与探空资料风绝对值差为 7.466383
云导风低层风与探空资料风平均误差为 2.583142
低层风与探空资料风样本数 12196




TESTWU~1 - [测试工作站上云导风的结果]
云图与结果显示功能 测试与比较显示功能
Running
Mouse input pending in
测试工作站上云导风的结果
开始
云导风微机版
Microsoft Developer Stu...
Microsoft PowerPoint - [...
未命名 - 画图
TESTWU~1 - [
11:01


TESTWU~1 - [测试工作站上云导风的结果]
云图与结果显示功能 测试与比较显示功能
Running
Mouse input pending in
测试工作站上云导风的结果
开始
云导风微机版
Microsoft Developer Stu...
Microsoft PowerPoint - [...
未命名 - 画图
TESTWU~1 - [
11:04


TESTWI~1 - [测试工作站上云导风的结果]
云图与结果显示功能 测试与比较显示功能
Running
Input pending in 测试工作站上云导风的结果
开始
Microsoft Developer Stu...
本地磁盘 (C:)
TESTWI~1 - [...
24_0504 - 画图
20:51

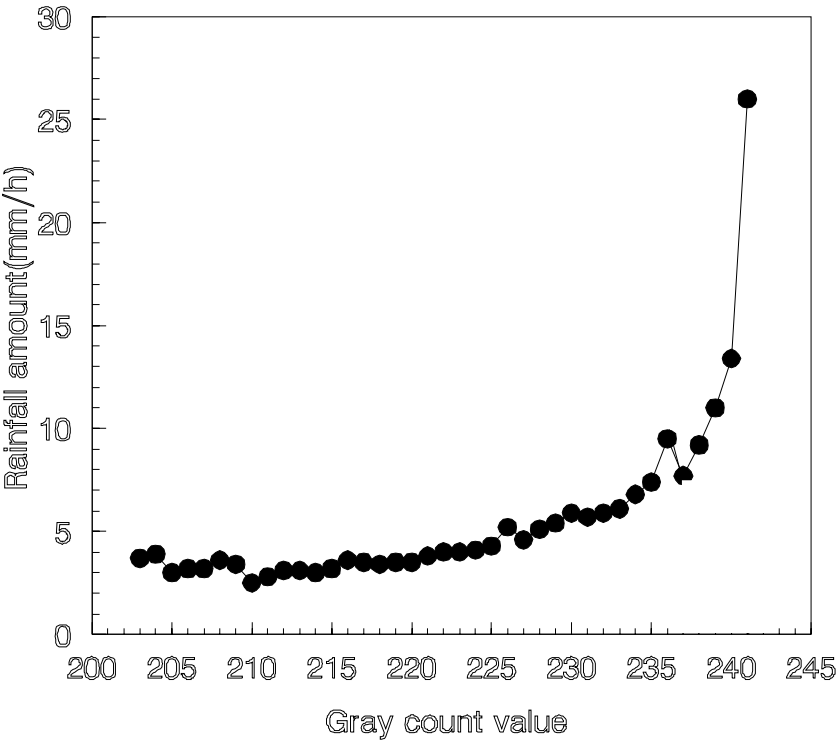

TESTWI~1 - [测试工作站上云导风的结果]
云图与结果显示功能 测试与比较显示功能
Running
Input pending in
测试工作站上云导风的结果
开始
Microsoft Developer Stu...
本地磁盘 (C:)
TESTWI~1 - [...
20:39

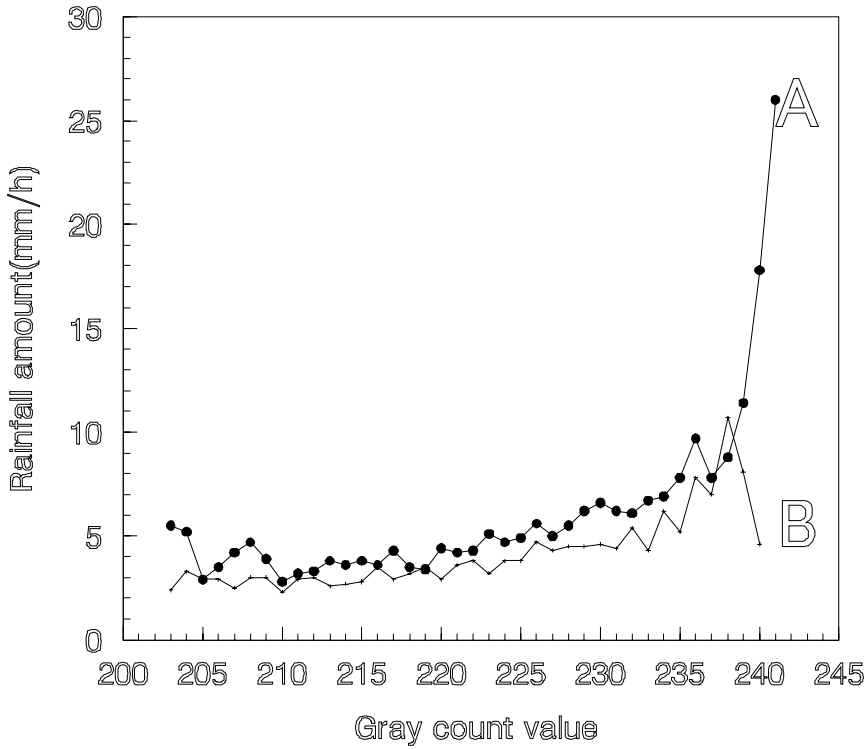
Precipitation Estimation

For expanding cloud, lower cloud top temperature means

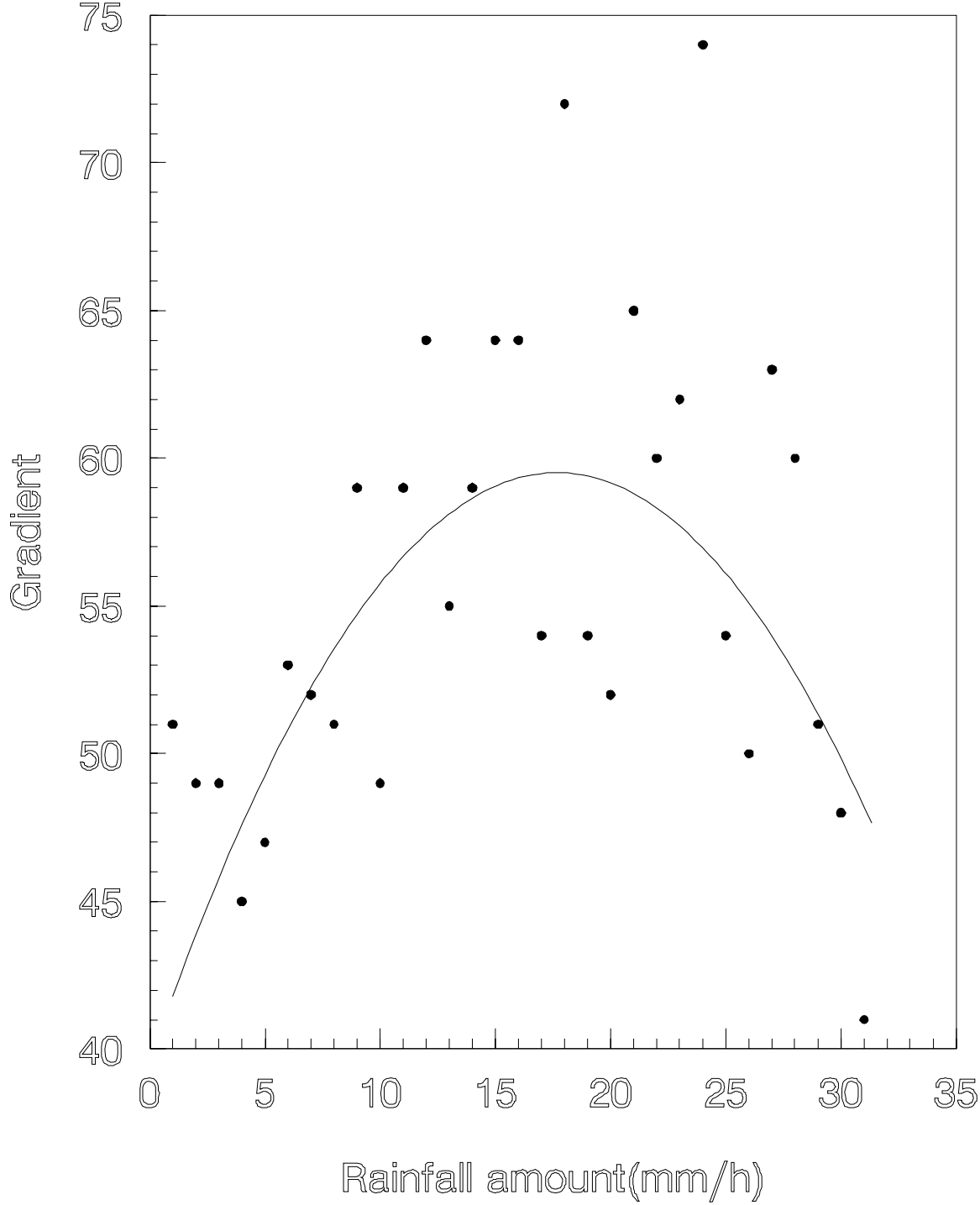
higher precipitation rate

For contracting cloud, lower cloud top temperature means higher precipitation rate

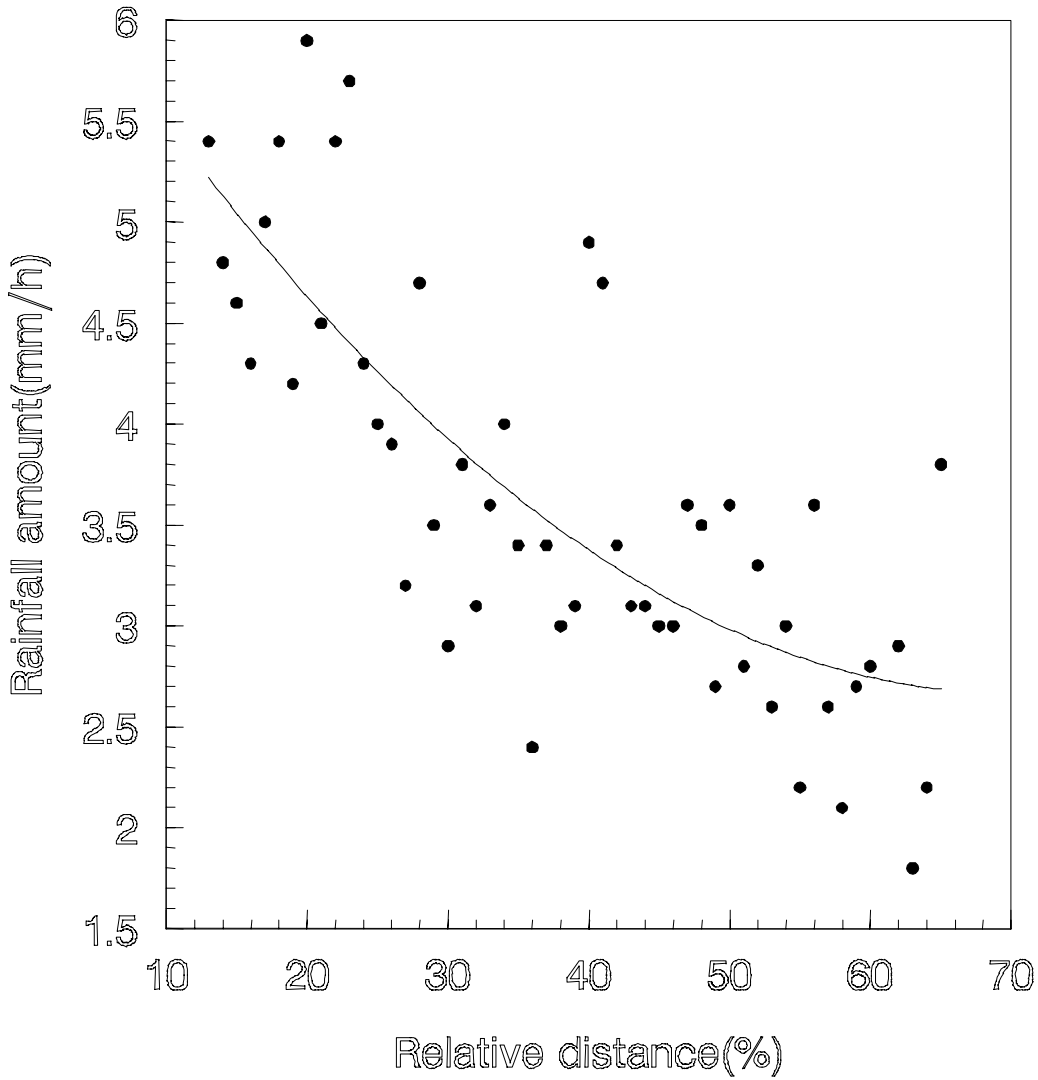




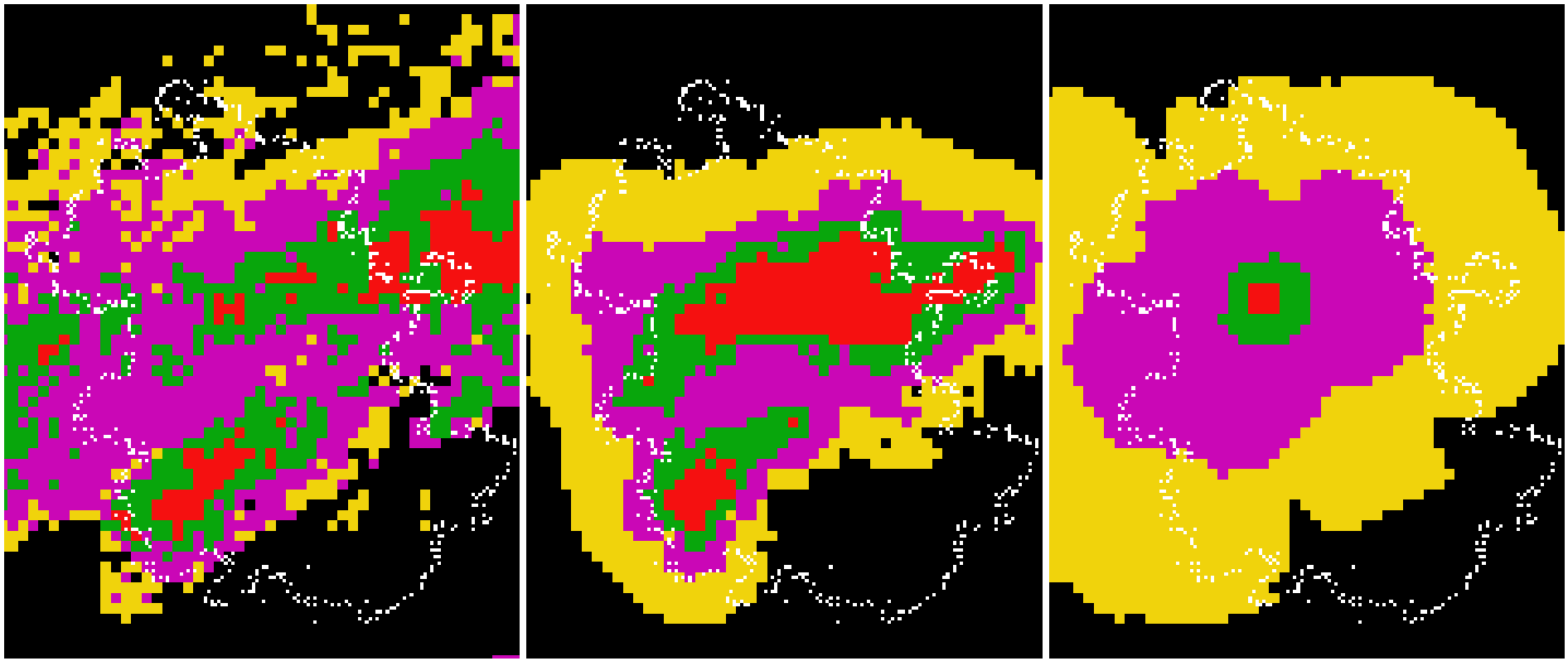
Cloud top temperature gradient and precipitation rate



Distance from convective core and precipitation rate



Merge with rainfall gage data



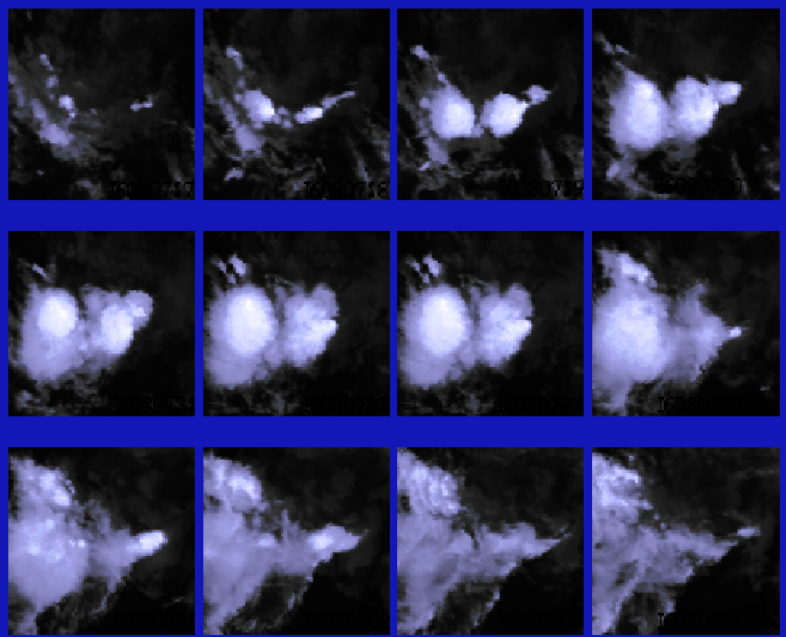
Merged data

Dense rainfall gage data

Rainfall gage data

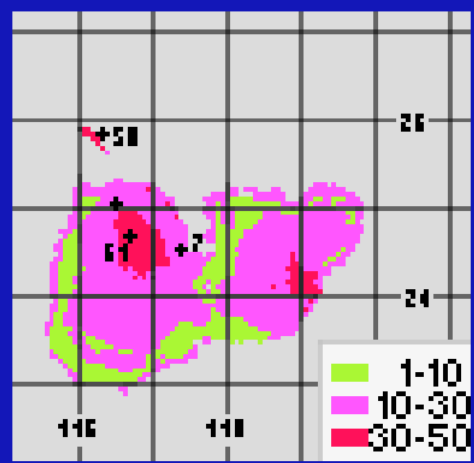
Example

96年8月7日17时----8日04时红外云图



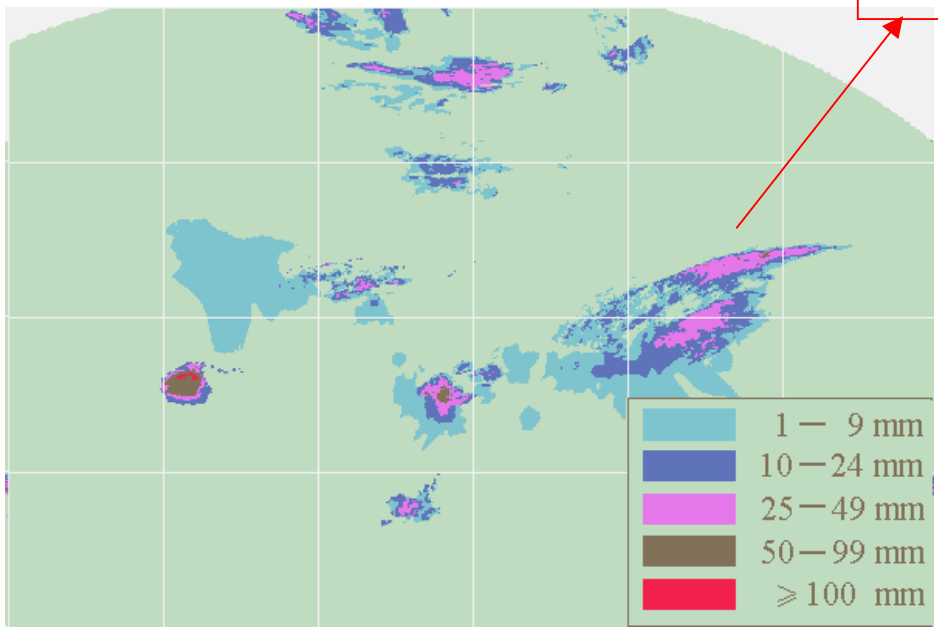
96年8月7日21时卫星云图

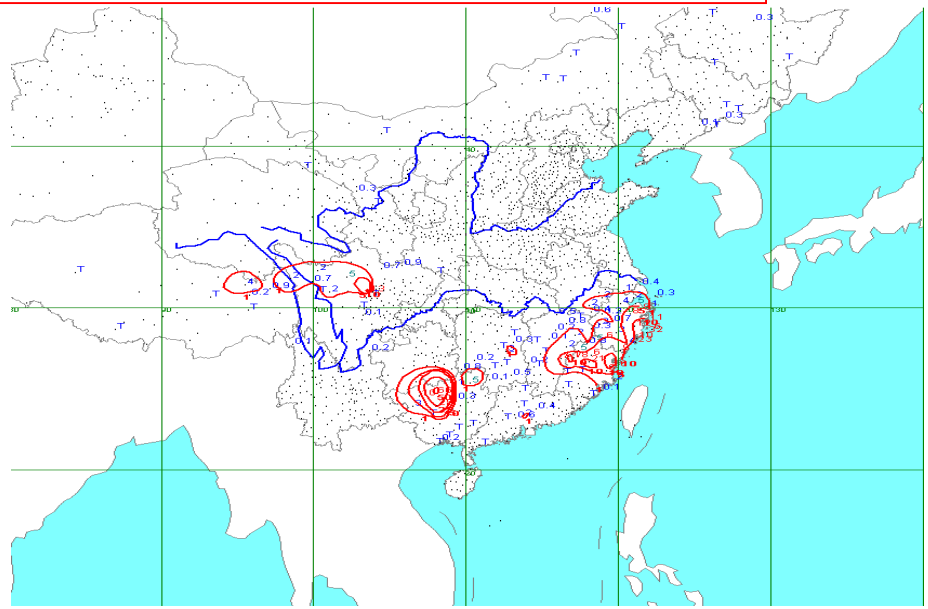
96年8月7日21时降水估计结果

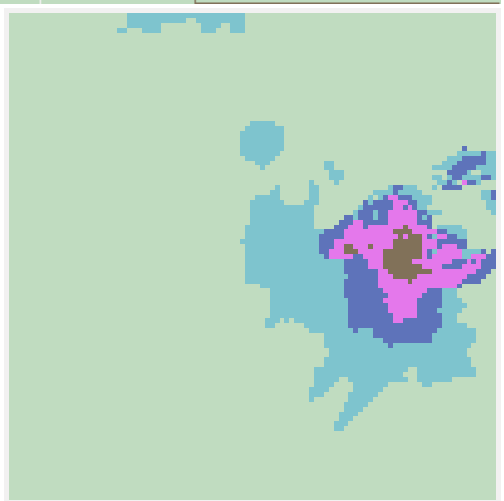


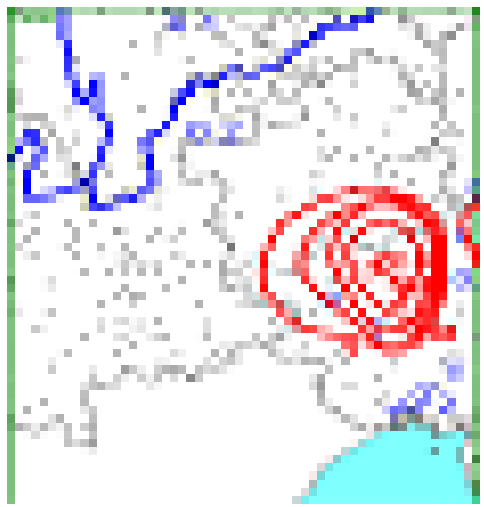
6 hourly precipitation□ 2005.04.22.18□04.23.00

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□



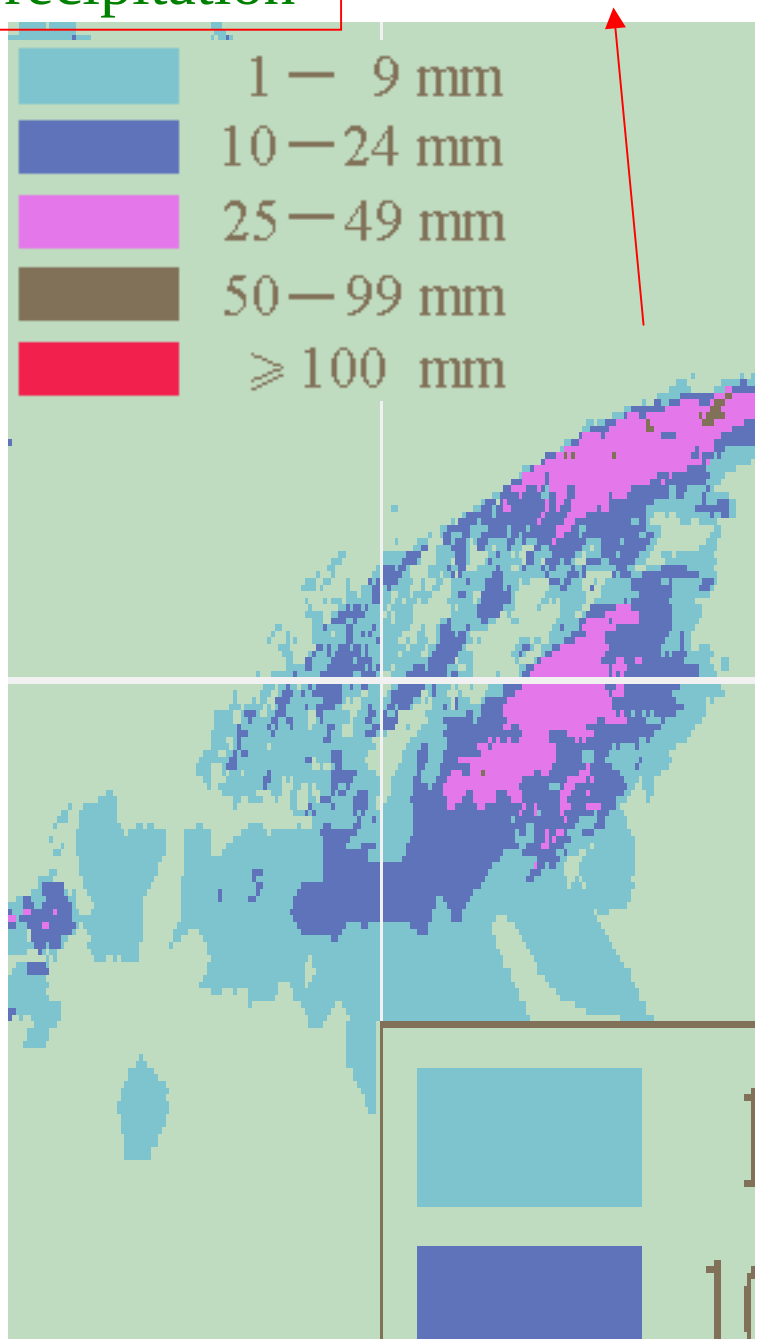


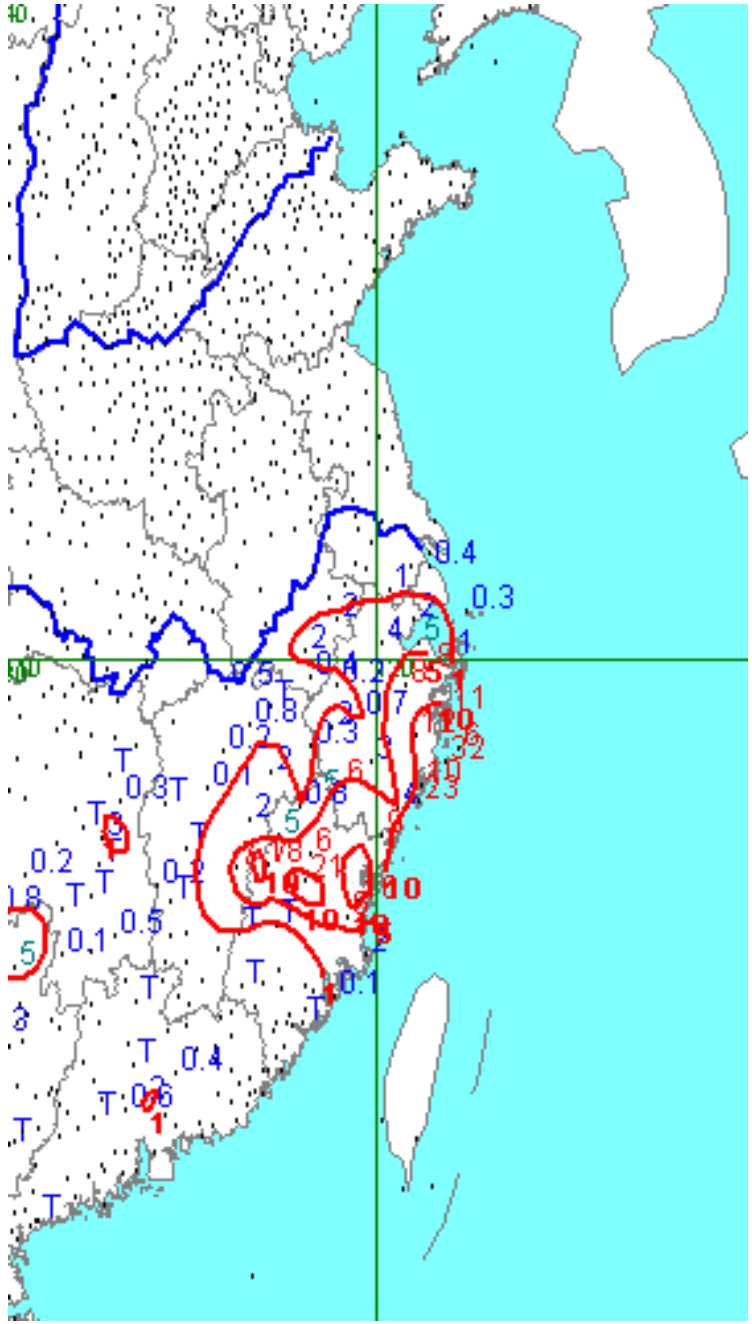




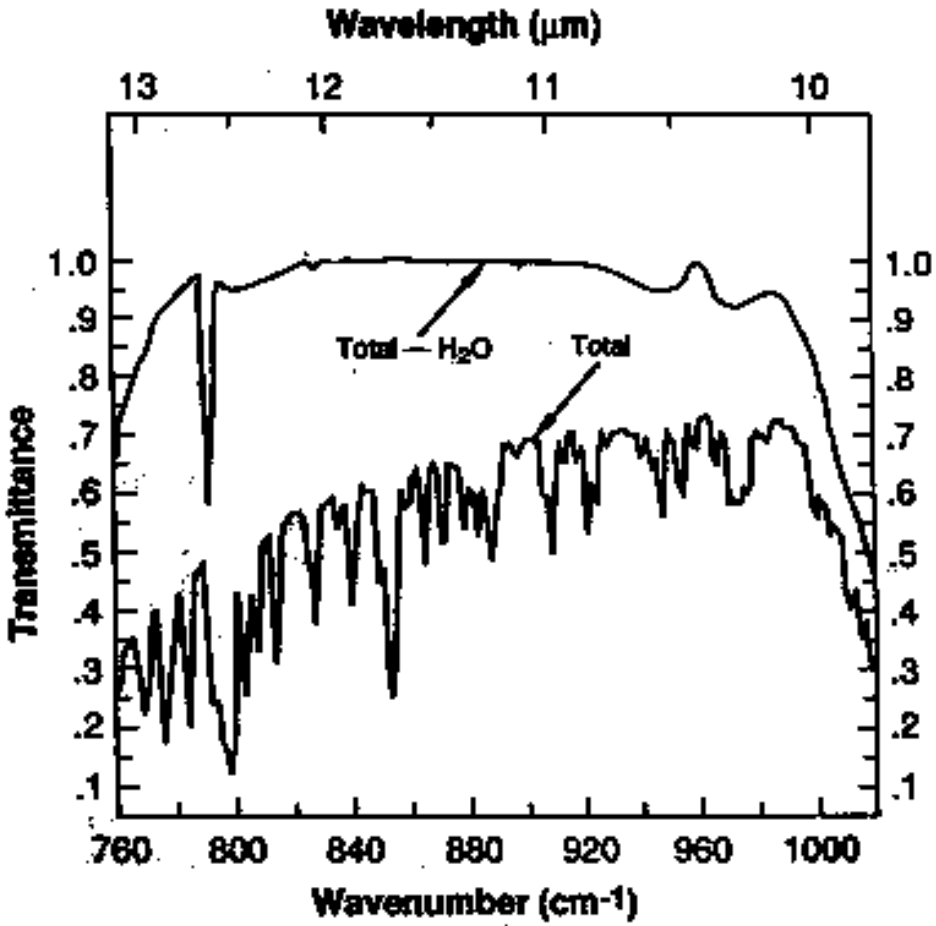
□□□□□□□
□□□□□□□

6 hourly precipitation





FY2C total precipitable water in clear sky region

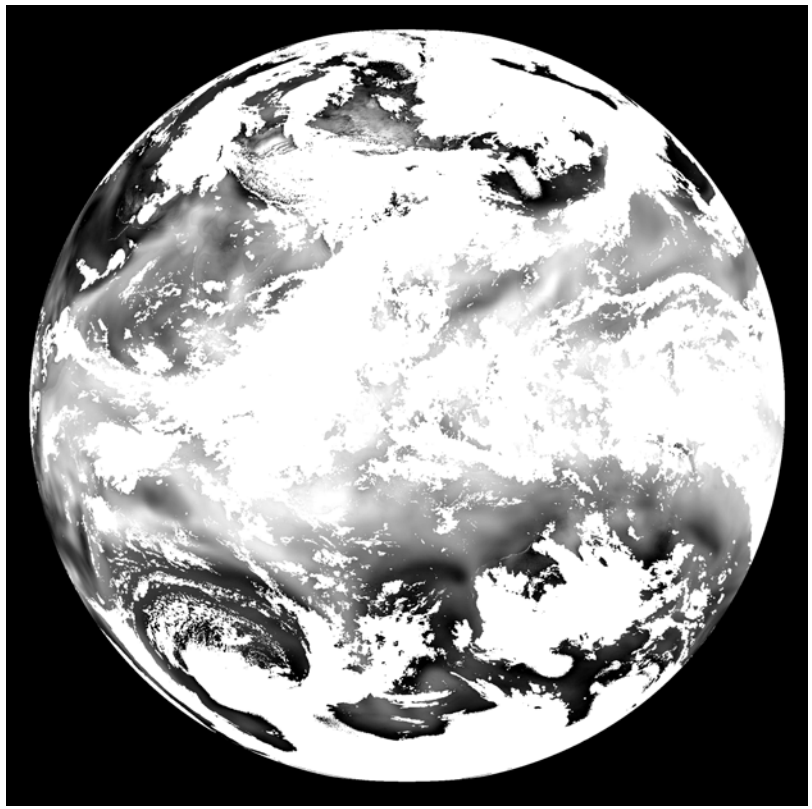


Total perceptible water is derived from two split window channels.

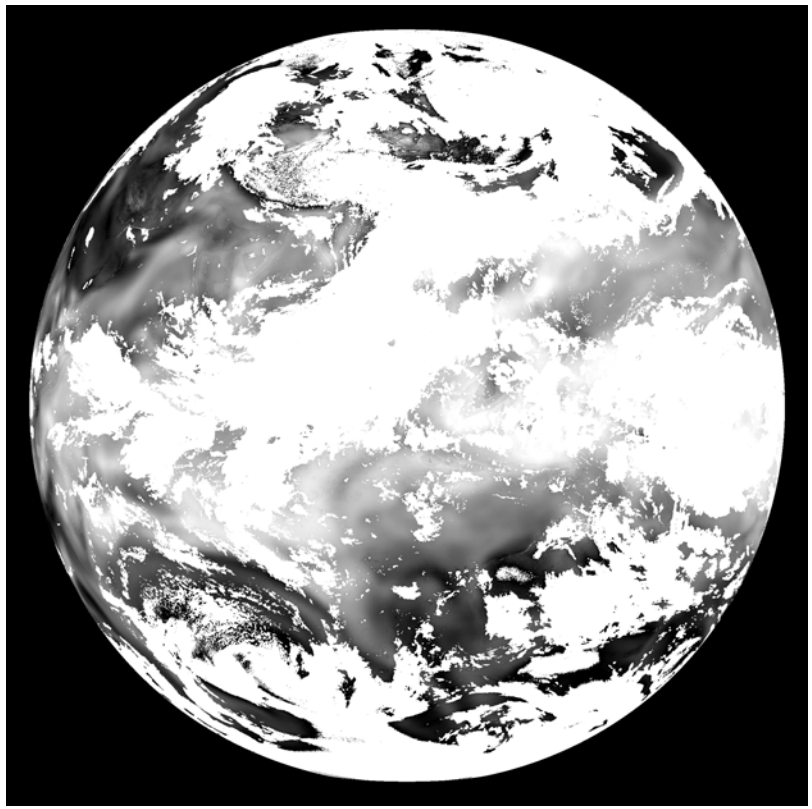
IR1: 10.3~11.3 μm

IR2: 11.5~12.5 μm

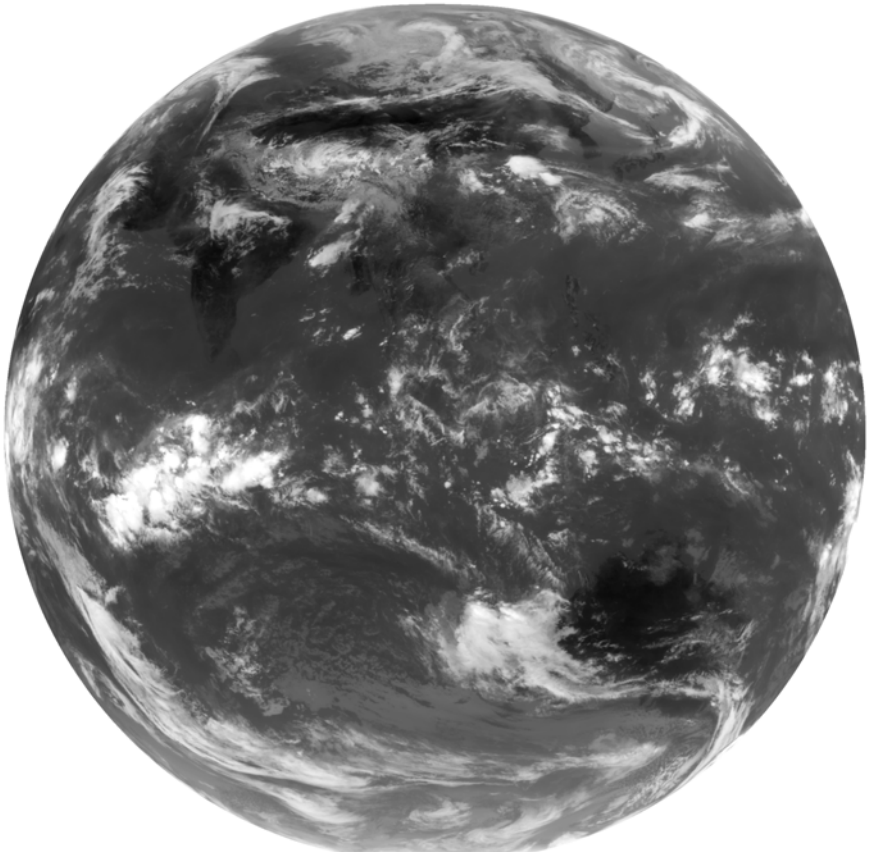
FY2C_TPW_MLT_NOM_2
0050507_0600_a.bmp



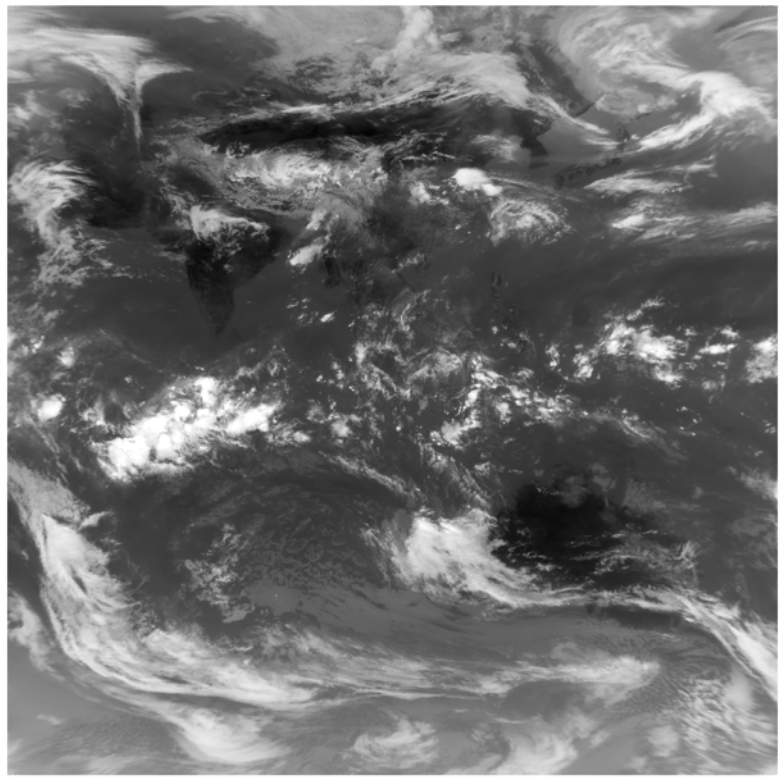
FY2C_TPW_MLT_NOM_2
0050508_0600_a.bmp



FY2C OLR

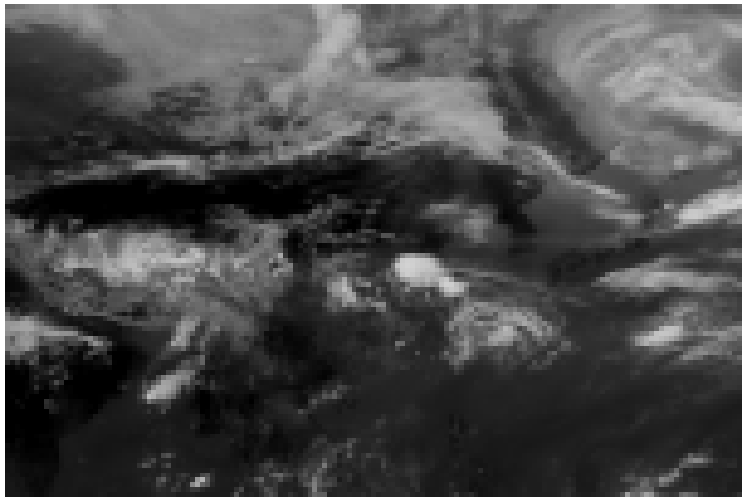


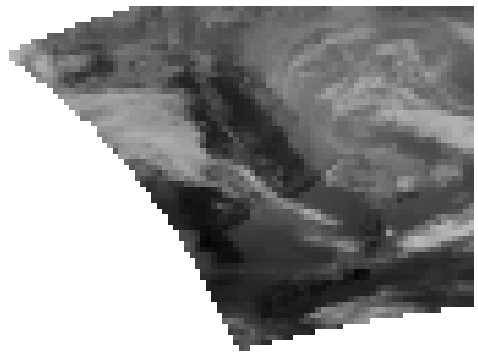
FY-2C实时OLR产品灰度图像（2005年4月29日04时56分，单位：瓦/米**2）



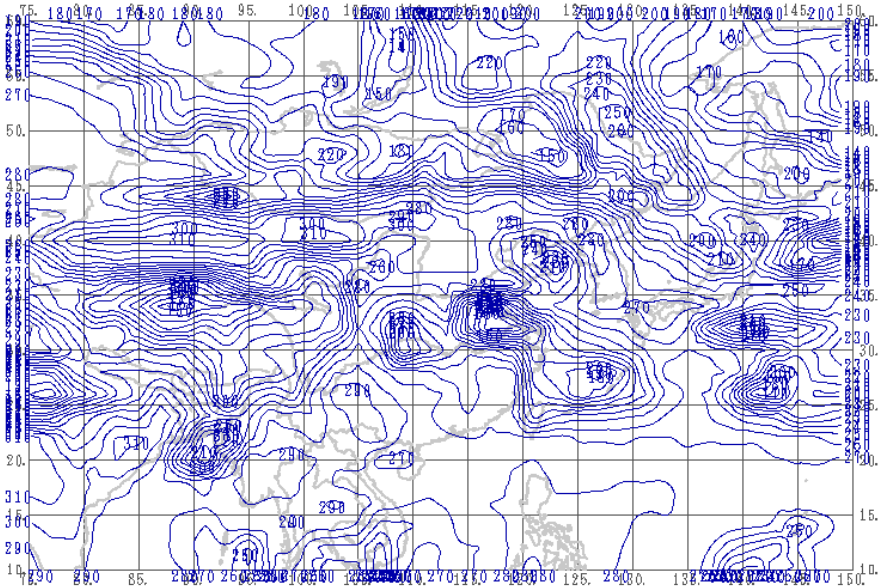
等经纬度投影OLR格点场灰度图像 60N-60S、45E-165E RES=0.1*0.1）

FY2C/NOAA OLR comparison

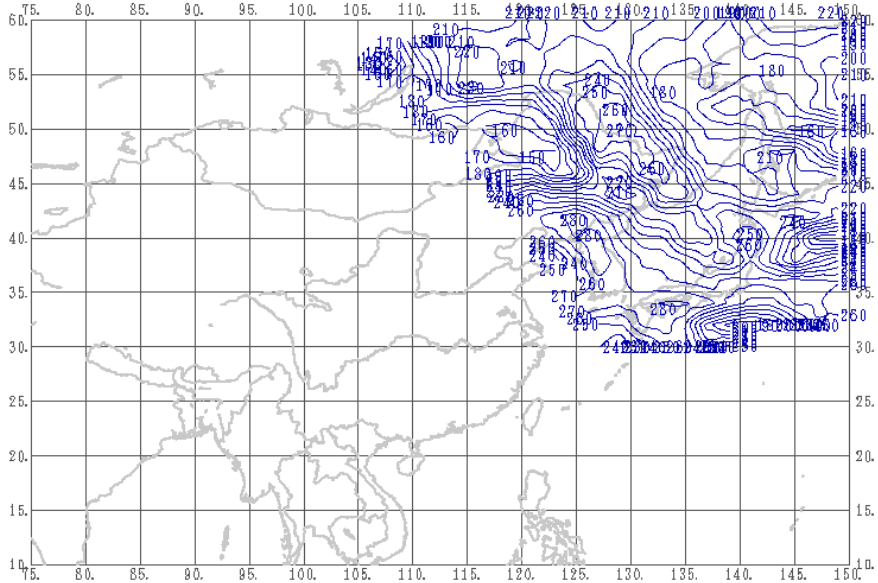




- FY-2C□NOAA-16□□
- OLR□10N-60N□75E-
- 150E□RES=0.5*0.5

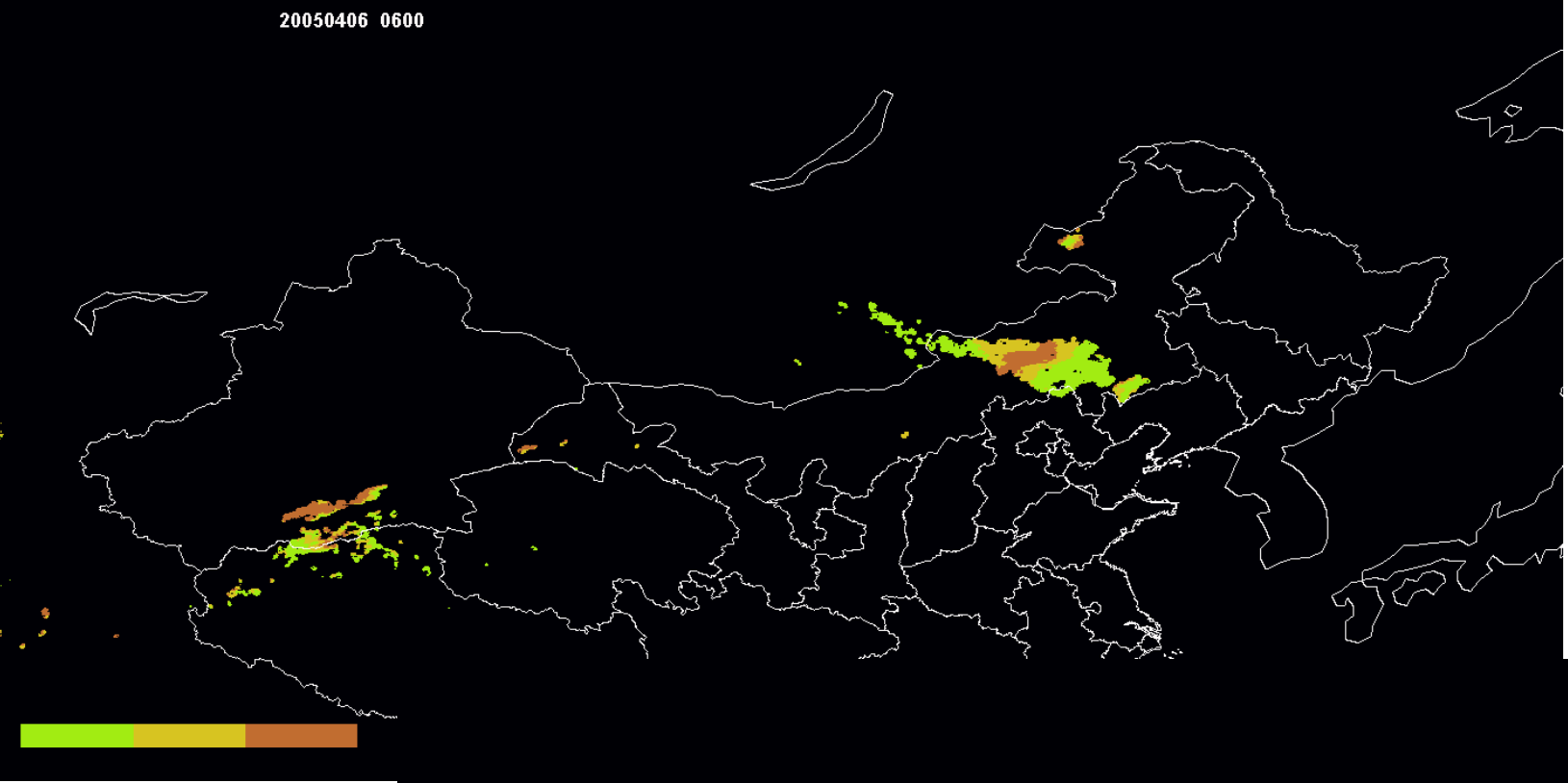


FY-2C实时OLR产品等值线图（2005年4月29日04时56分
局部，单位：瓦/米**2）

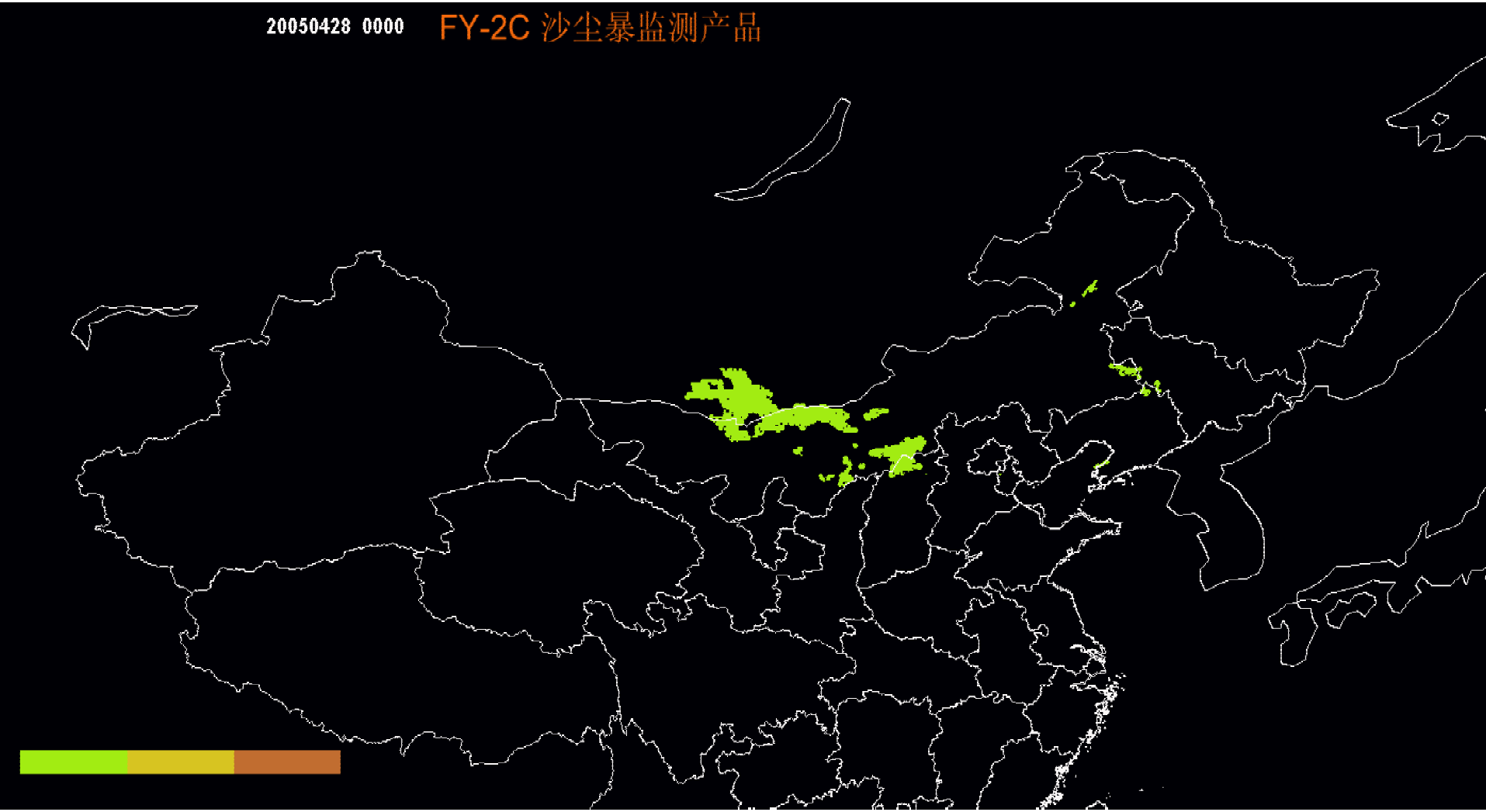


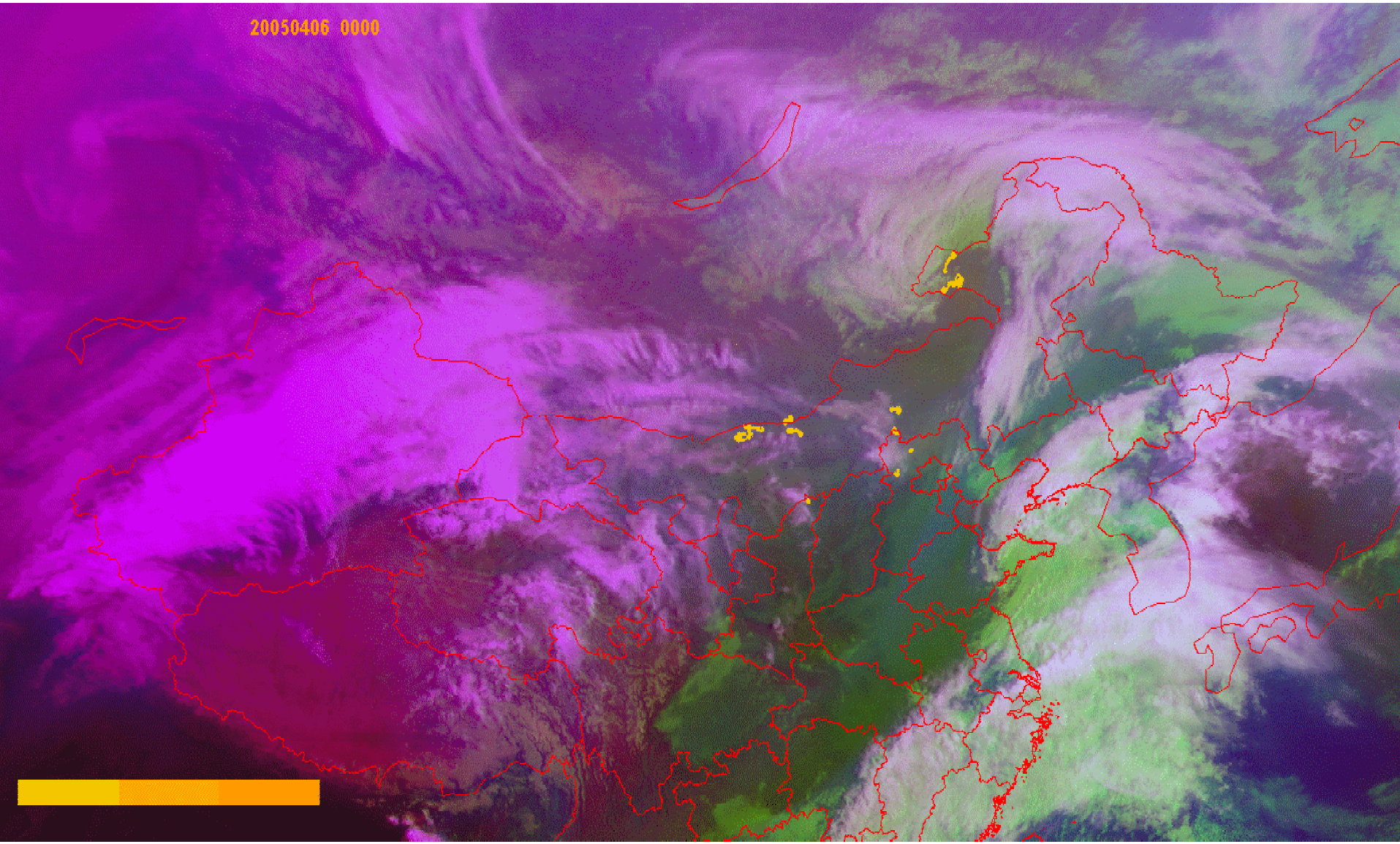
NOAA-16实时OLR产品等值线图（2005年4月29日04时44分
，单位：瓦/米**2）

TBB

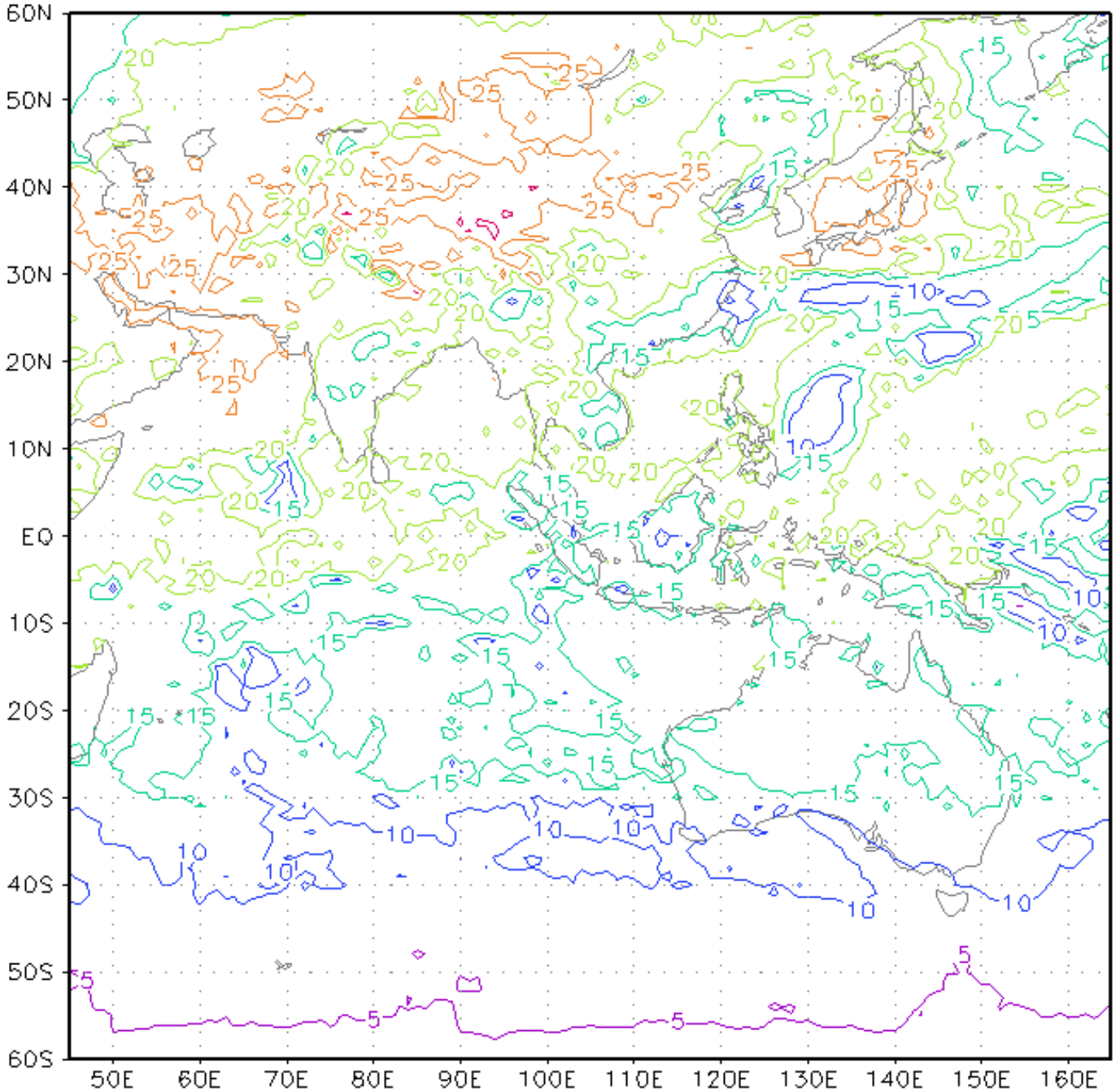


Sand Storm


20050428 0000
FY-2C 沙尘暴监测产品

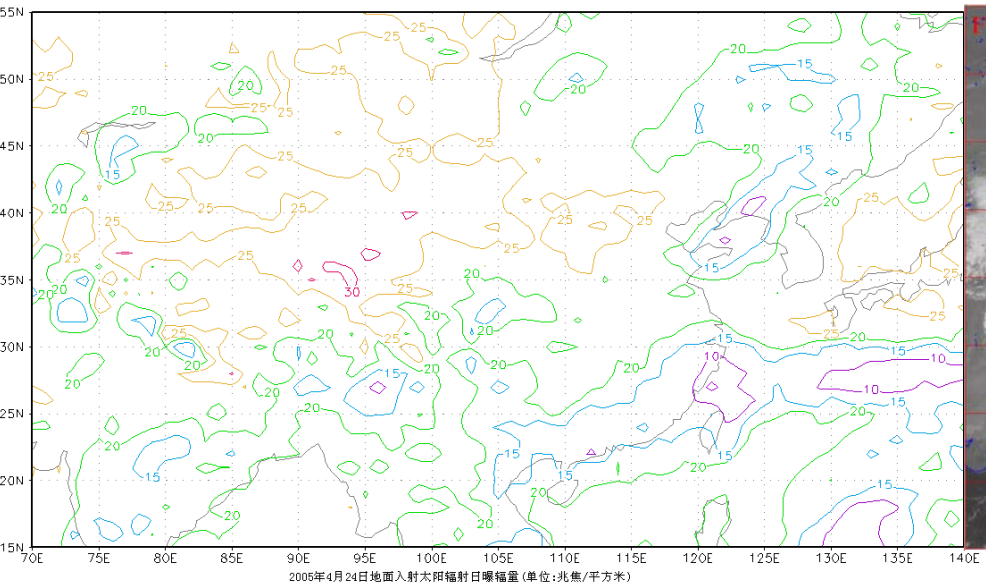

20050406 0000

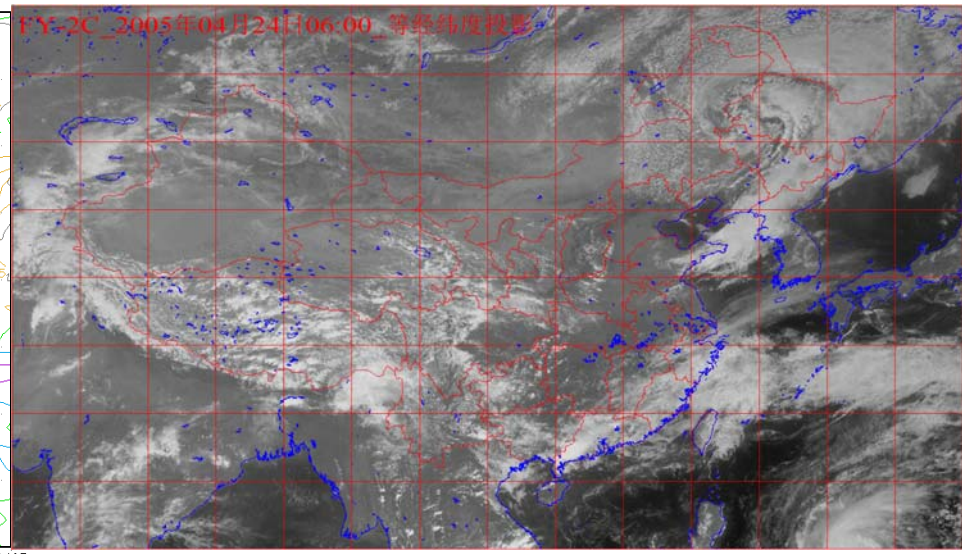
Solar irradiance for the disk



2005年4月24日FY2C卫星观测范围内的地面入射太阳辐射日曝辐量(单位:兆焦/平方米)

Solar irradiance for China region at 24 April 2005/06Z

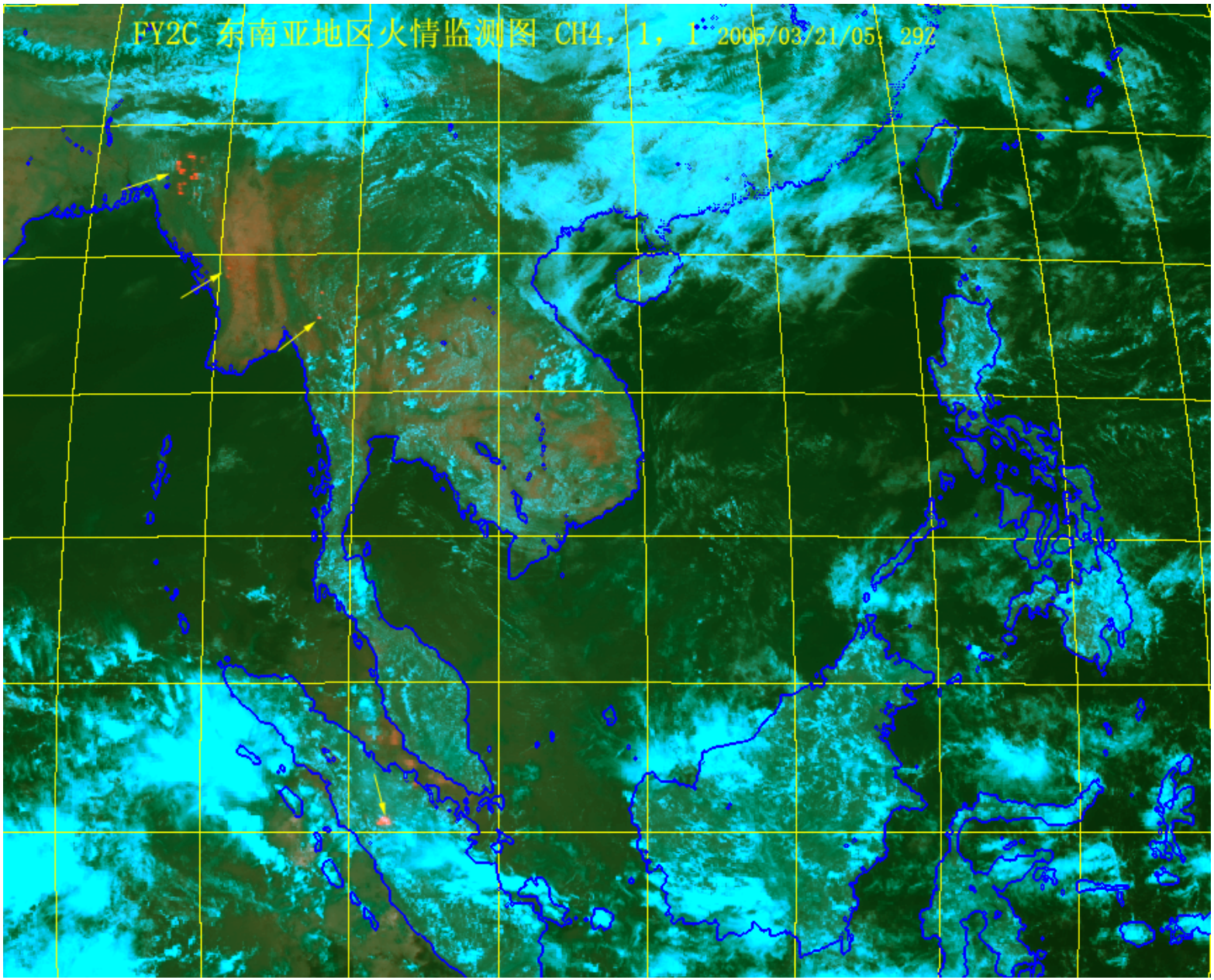




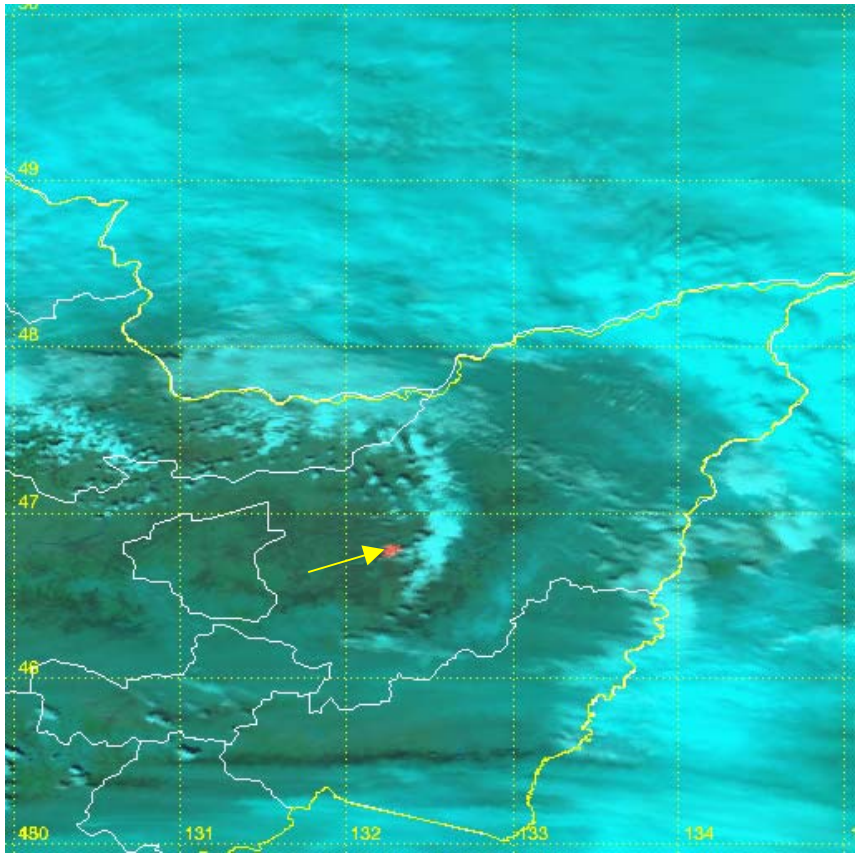
Sloar irradiance

VIS image

FY2C fire monitoring in south east Asia（March 21 2005 0529Z）

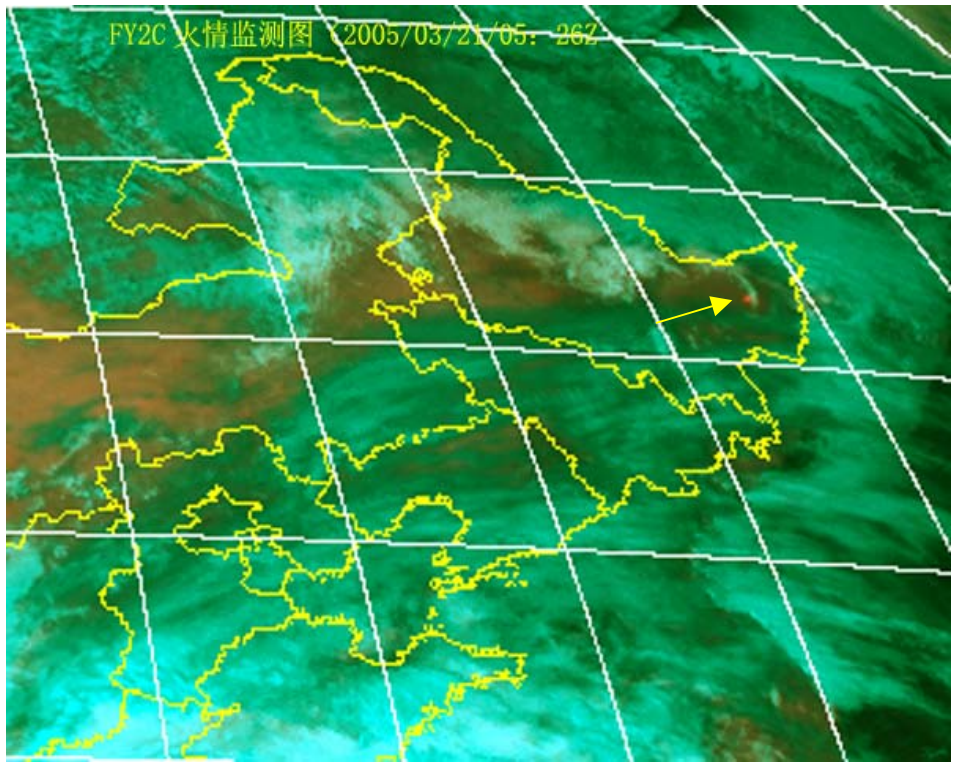


FY2C fire monitoring compared with NOAA-16



NOAA-16 fire monitoring

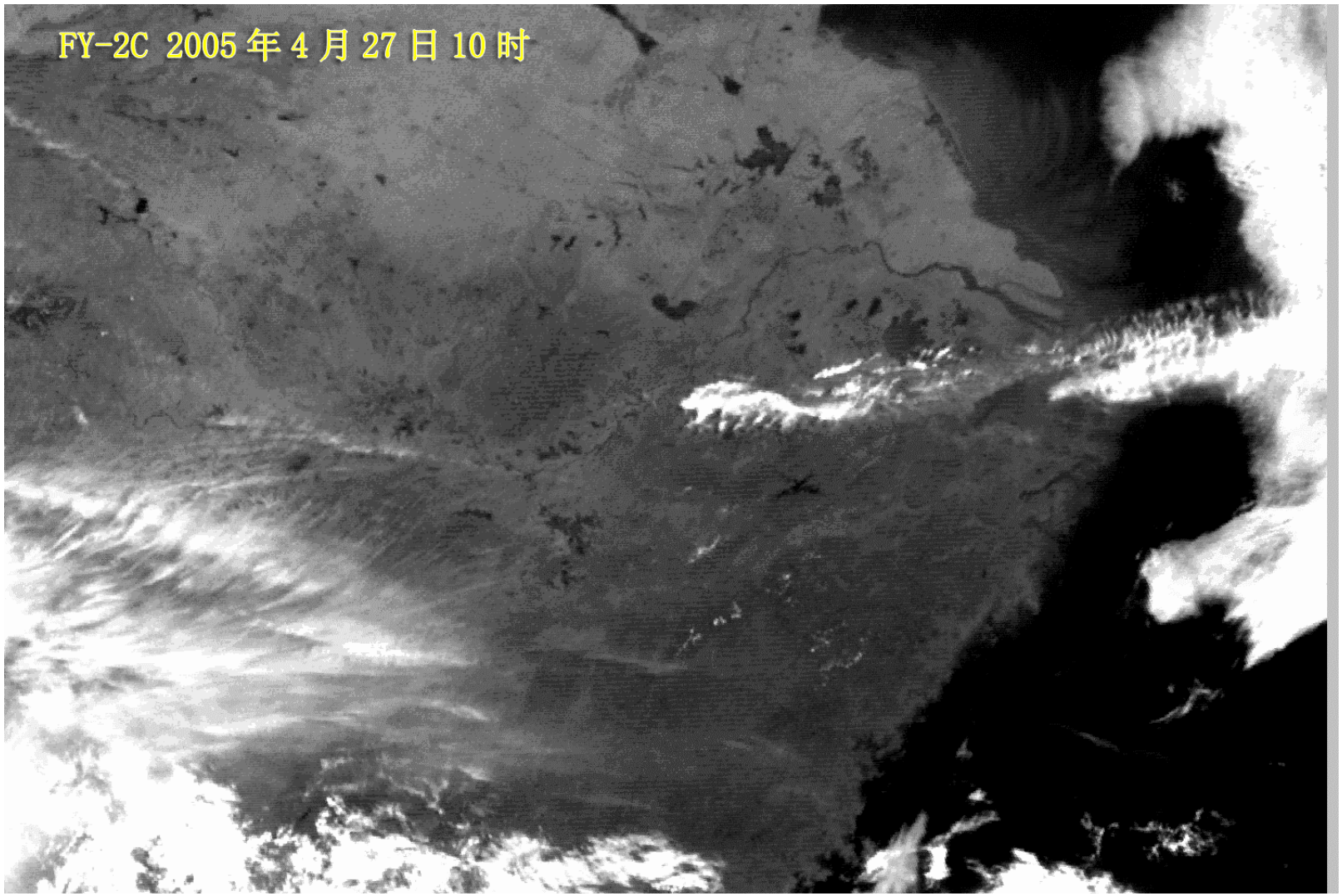
2005/03/21/05□26Z



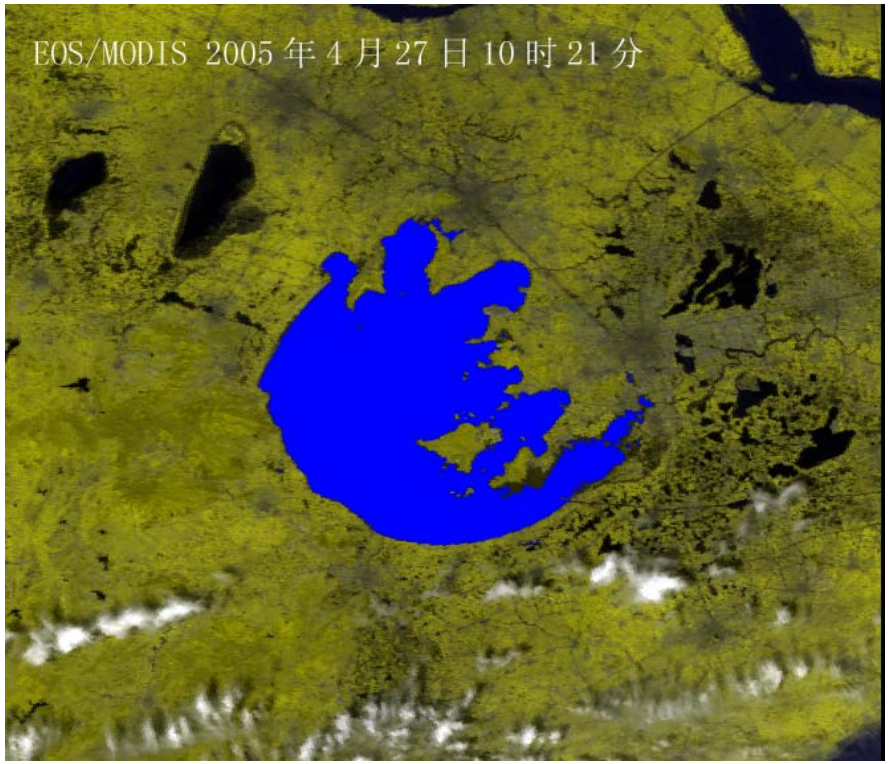
FY2C fire monitoring

2005/03/21/05□26z

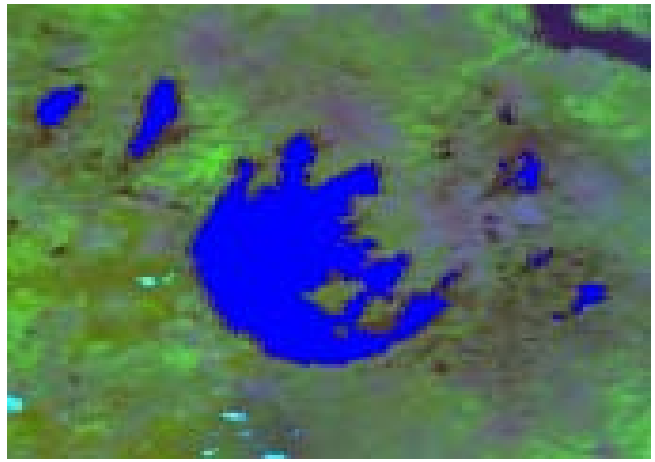
FY2C Flood Monitoring



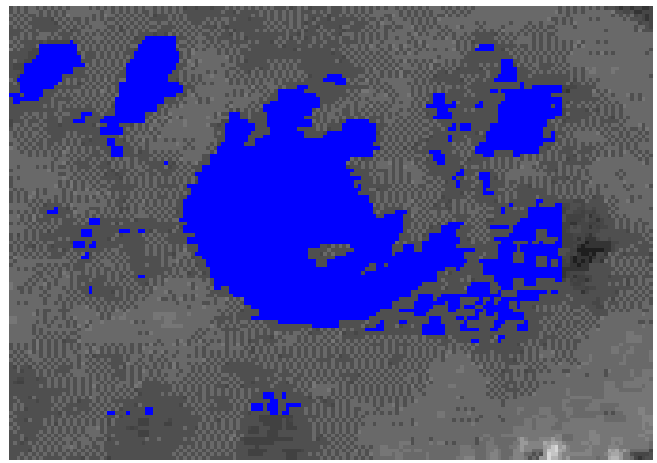
FY-2C 2005 4 27 10 -14



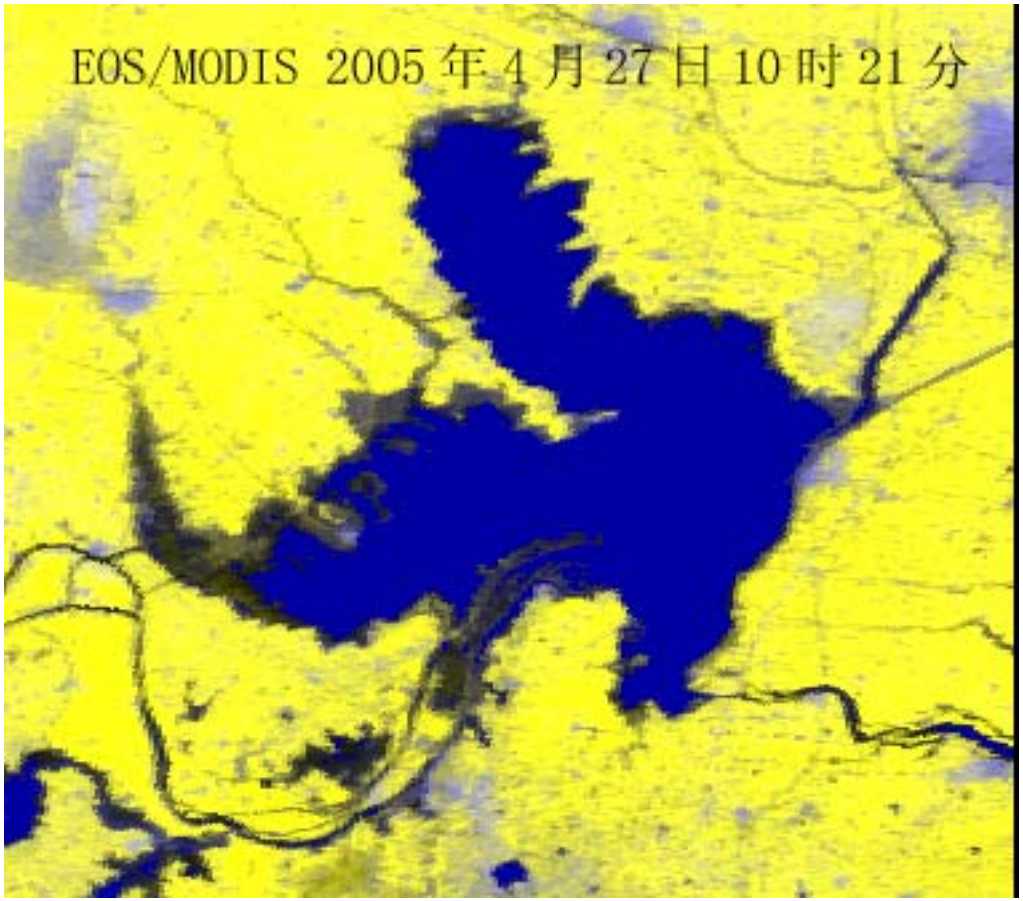
EOS/MODIS 200504271021



NOAA-16 200504271441



FY-2C 200504271100



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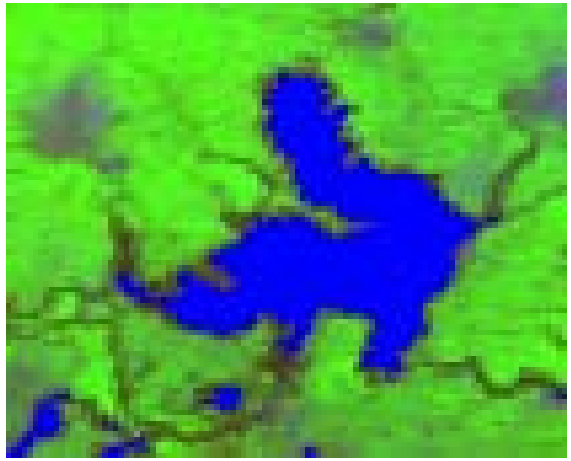
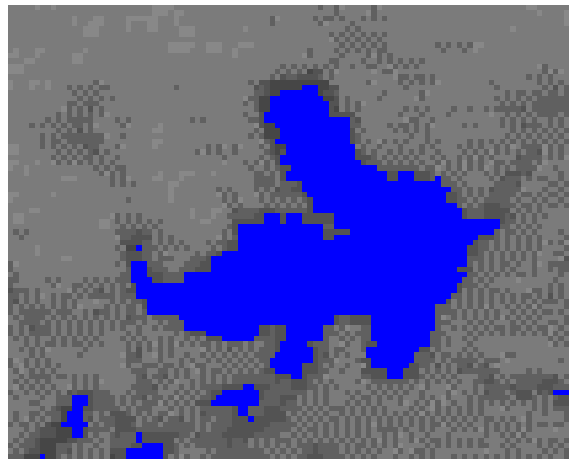
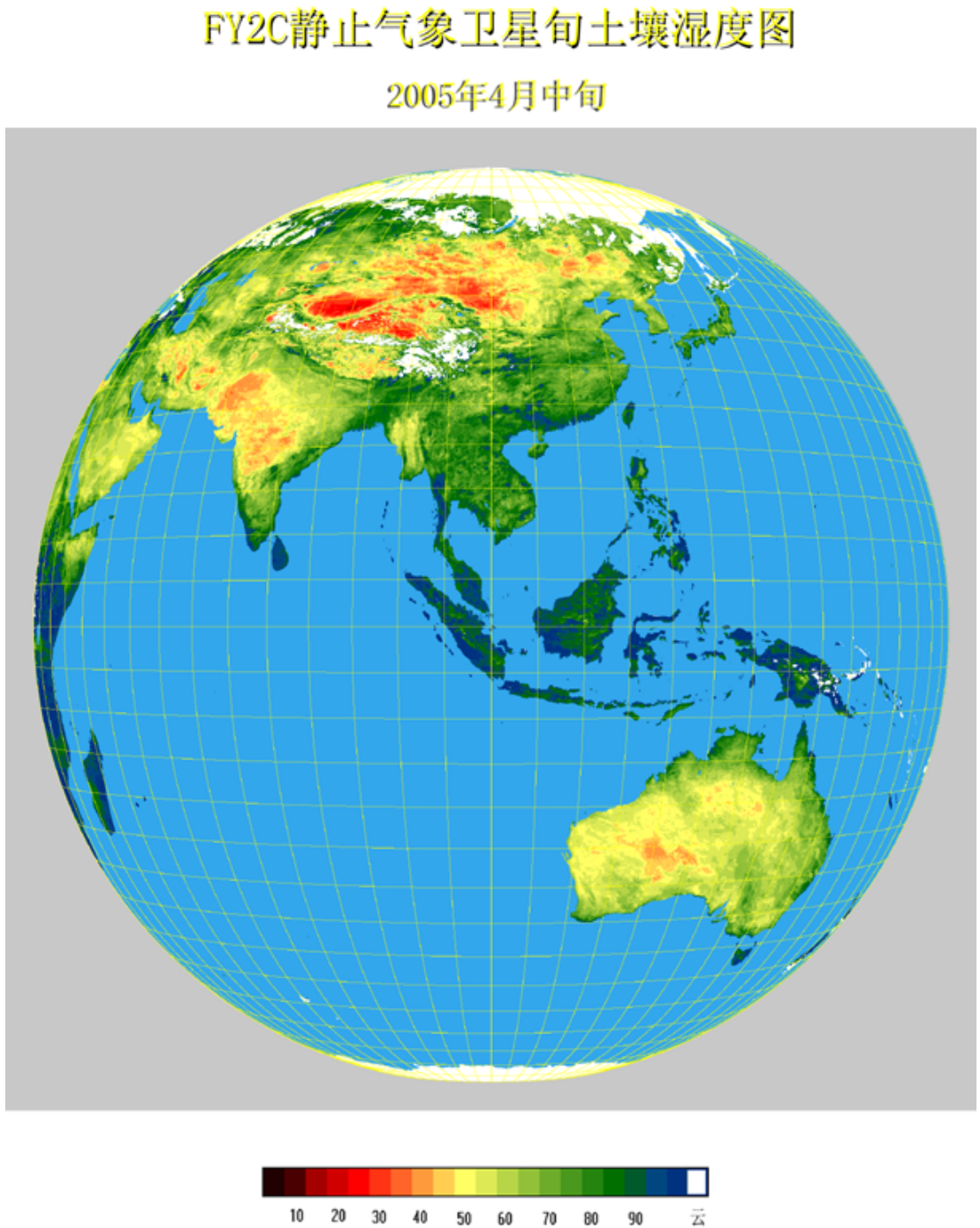


NOAA-16 200504271441

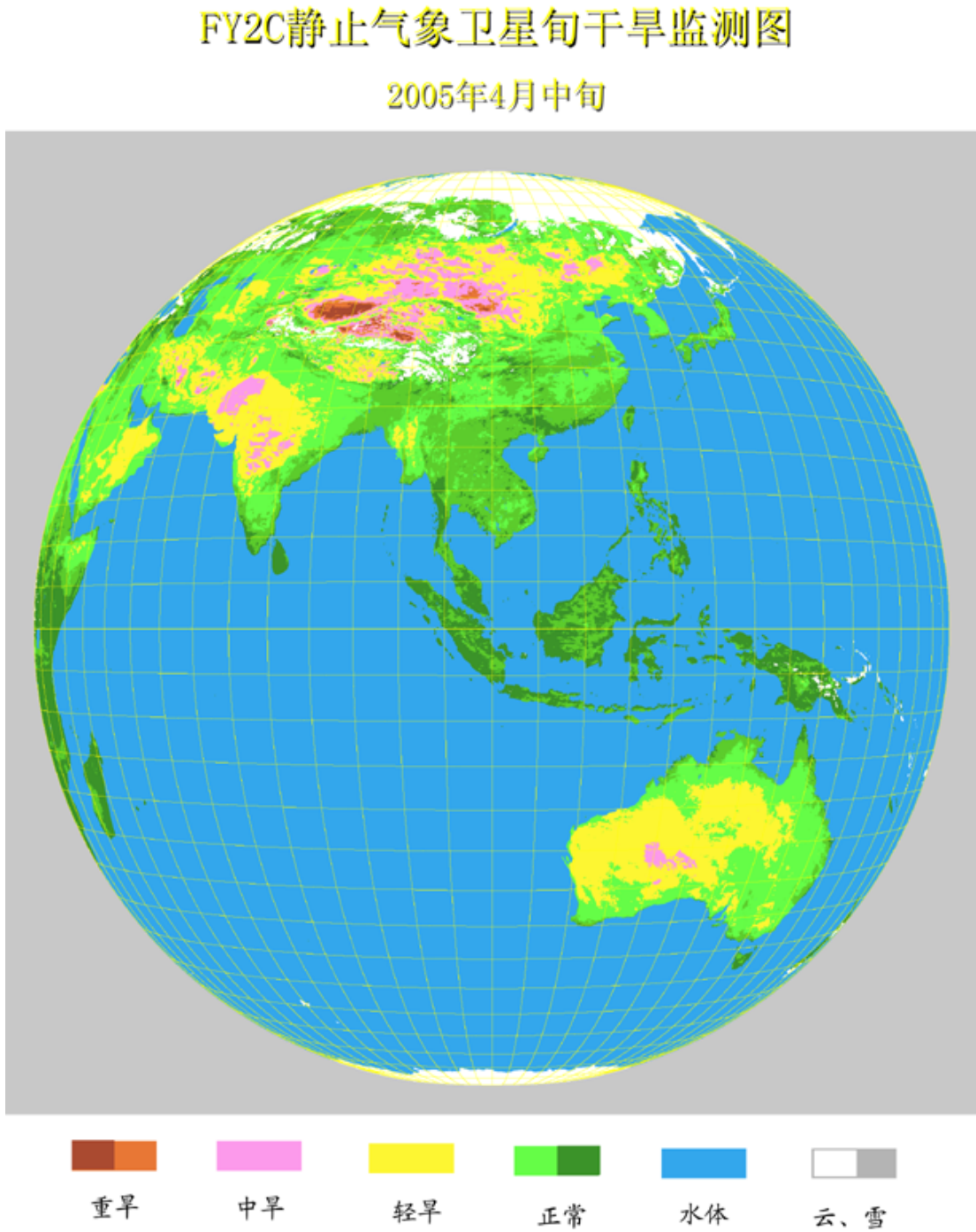


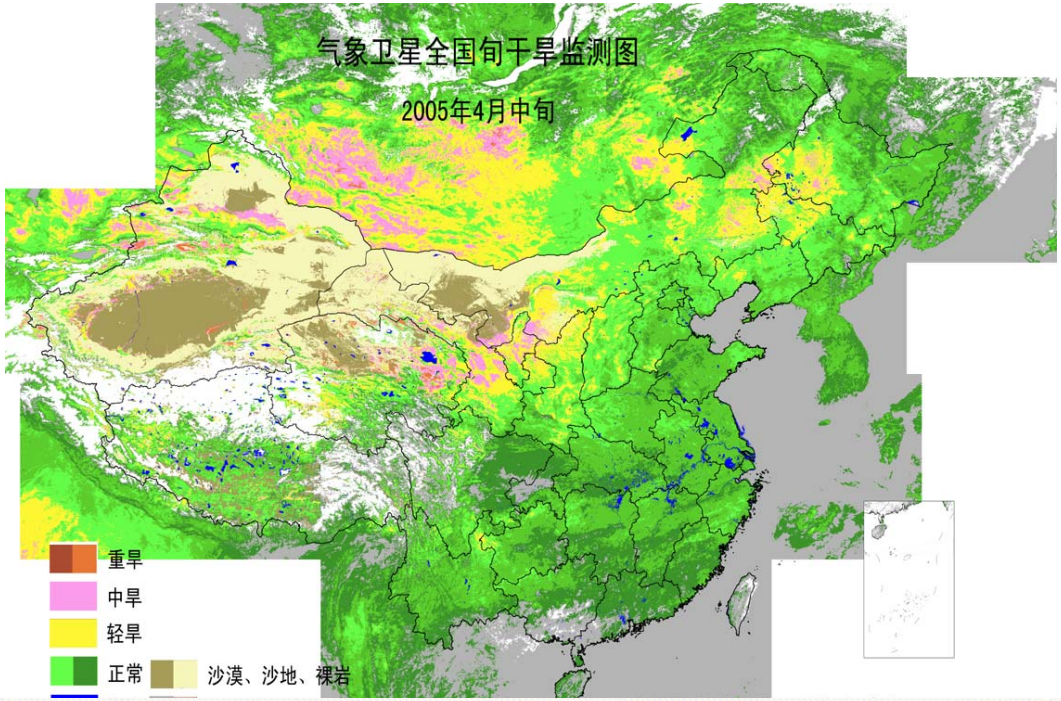
FY-2C 200504271100

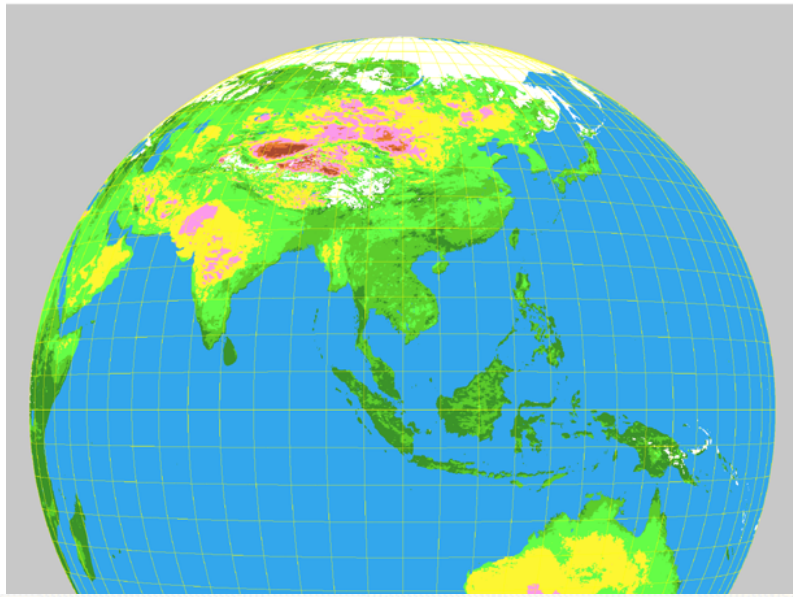
Soil moisture estimated with ground temperature tendency

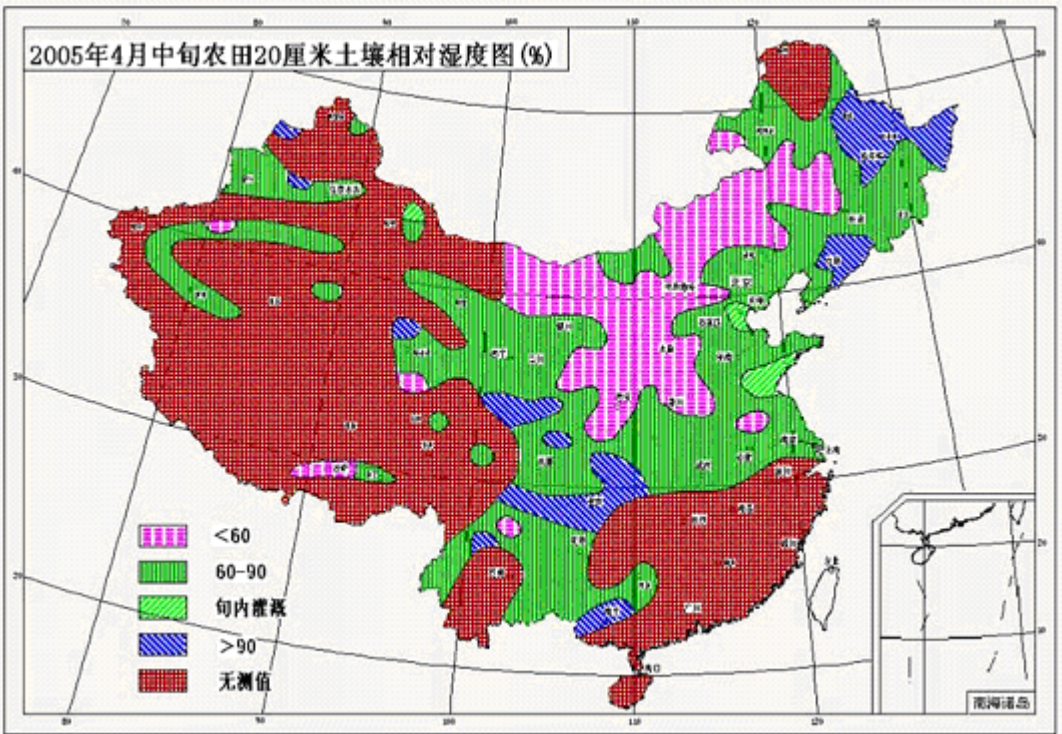


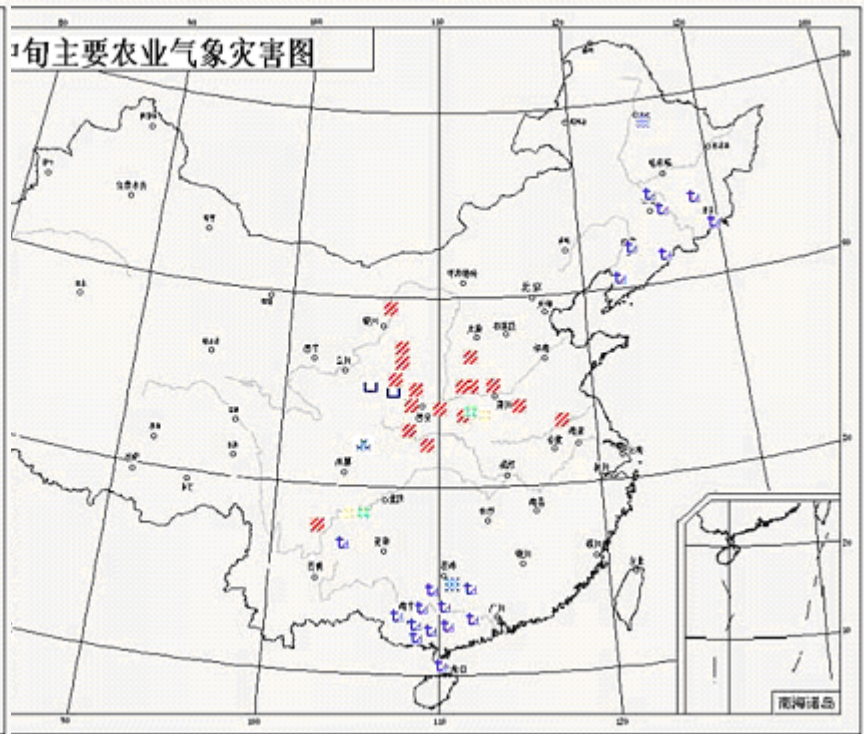
Drought grade



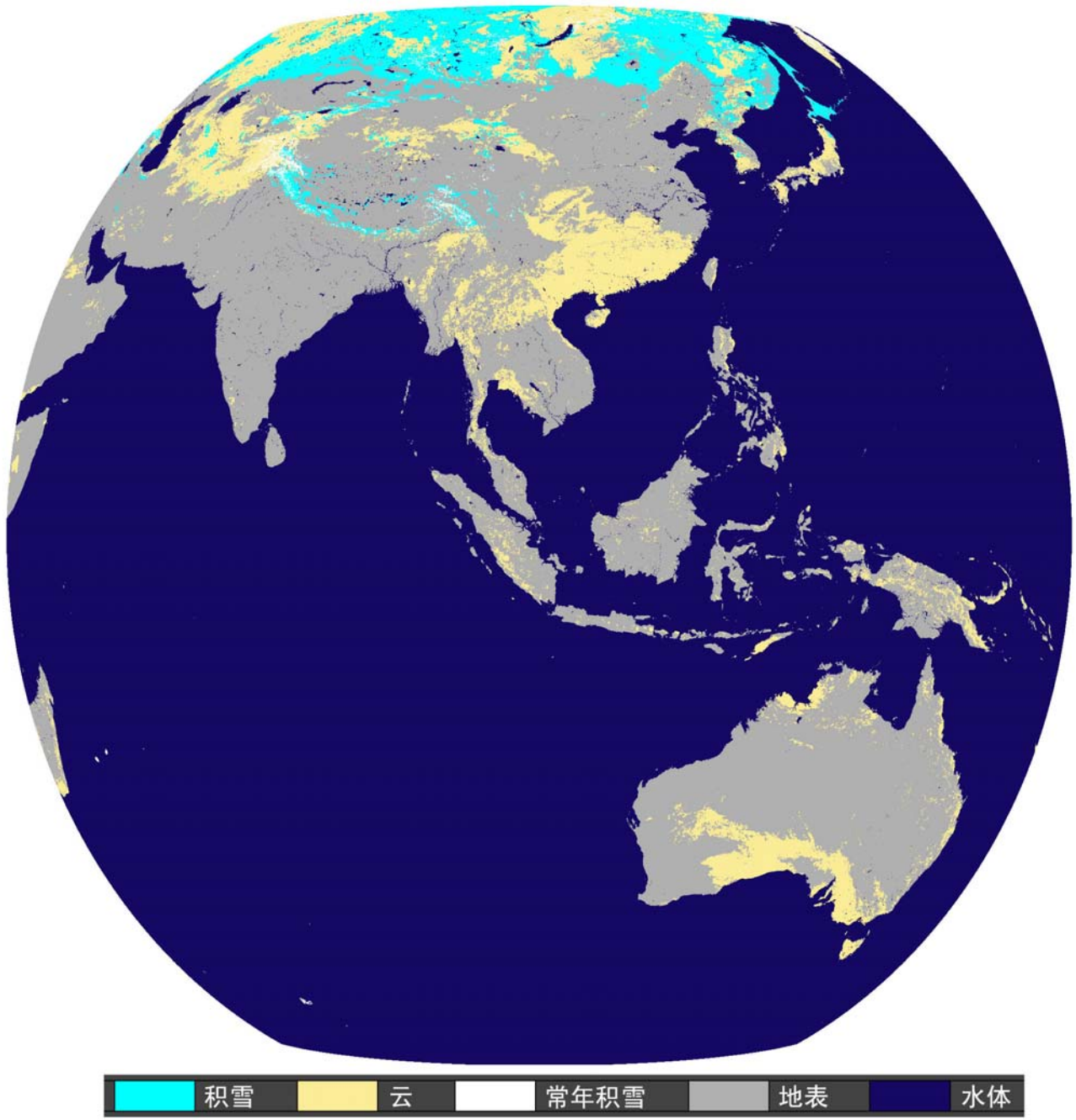

气象卫星全国旬干旱监测图
2005年4月中旬
重旱
中旱
轻旱
正常
沙漠、沙地、裸岩


FY2C静止气象卫星旬干旱监测图
2005年4月中旬

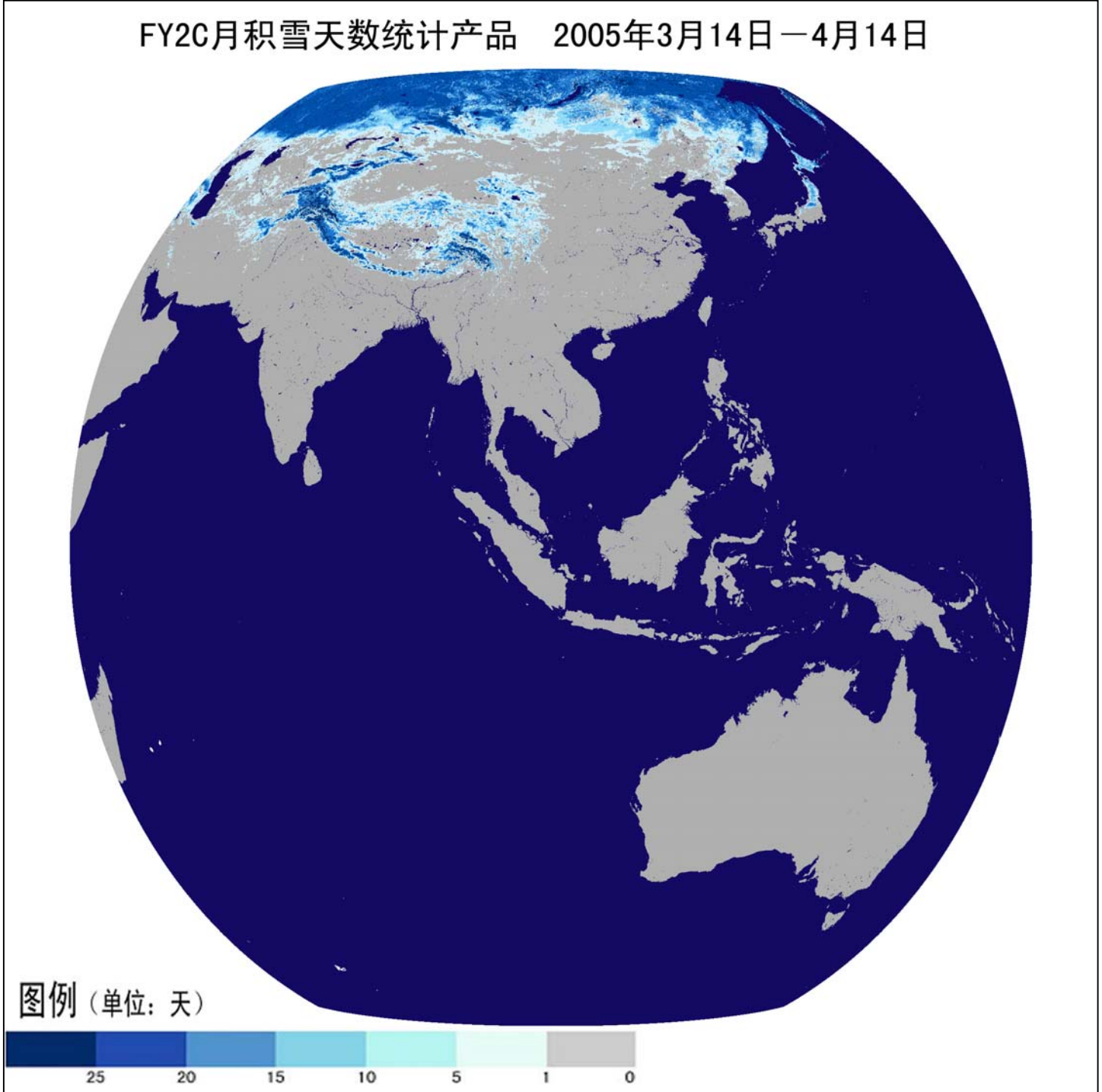

2005年4月中旬农田20厘米土壤相对湿度图(%)
<60
60-90
旬内灌溉
>90
无测值


旬主要农业气象灾害图

FY2C snow cover

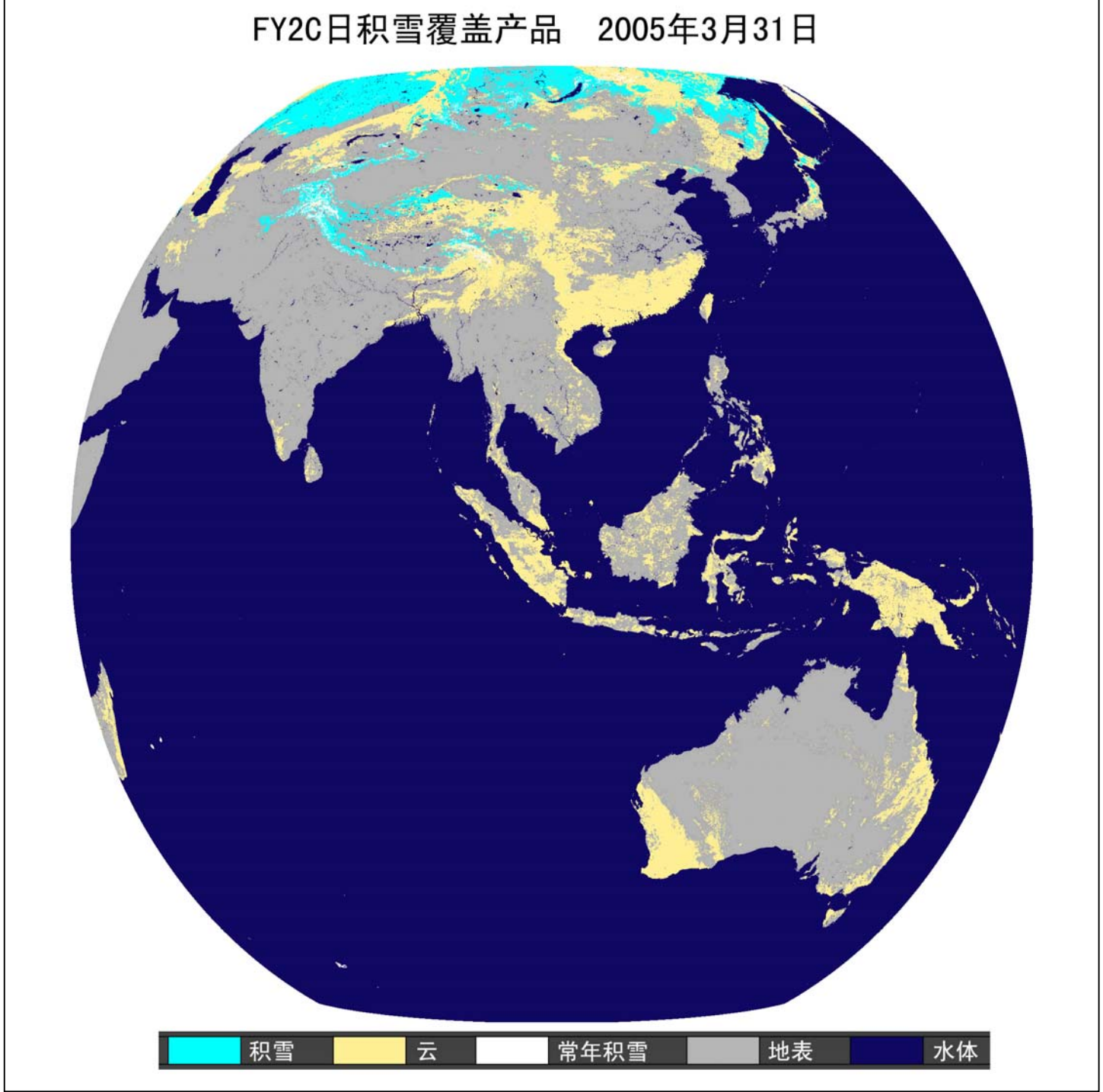


Snowy days in the month



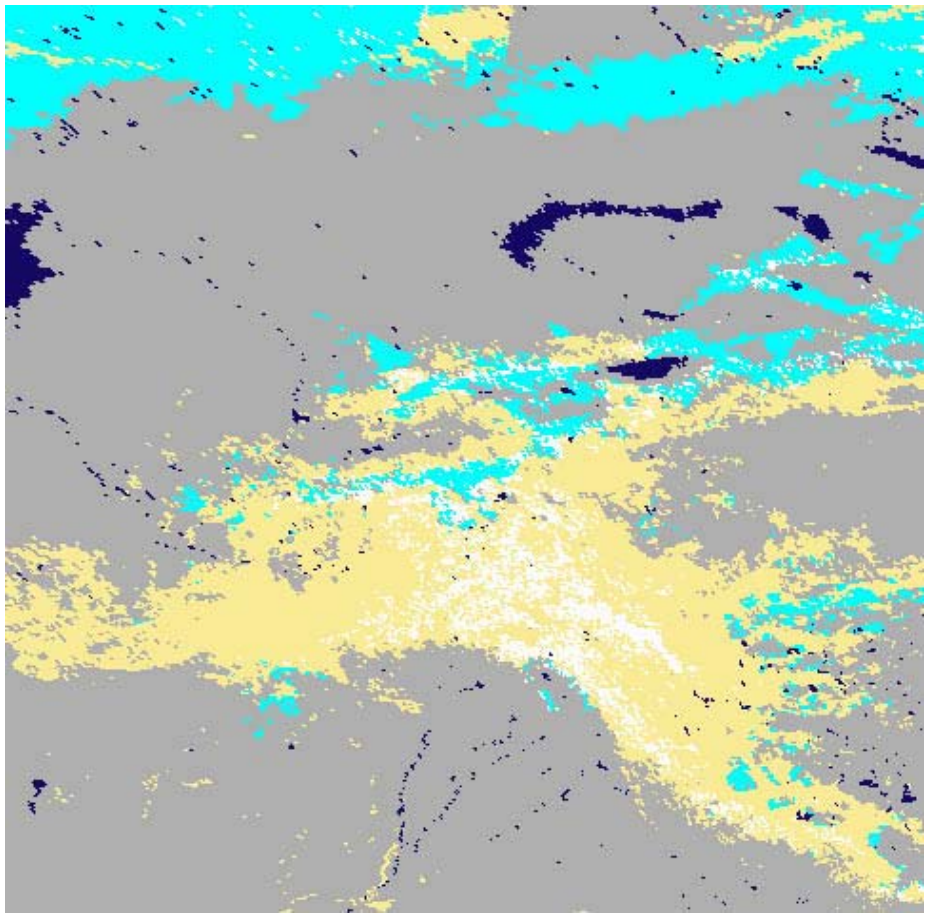
Snow cover movie

9-31 March 2005



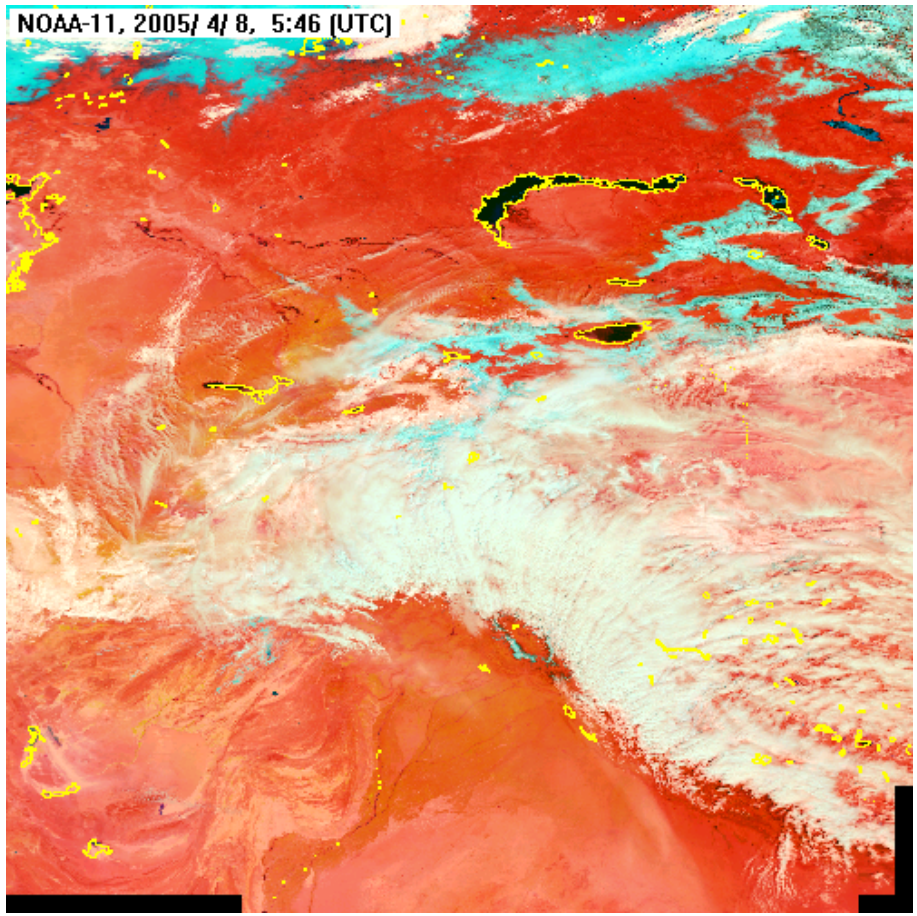
FY2C snow cover

2005□4□8□

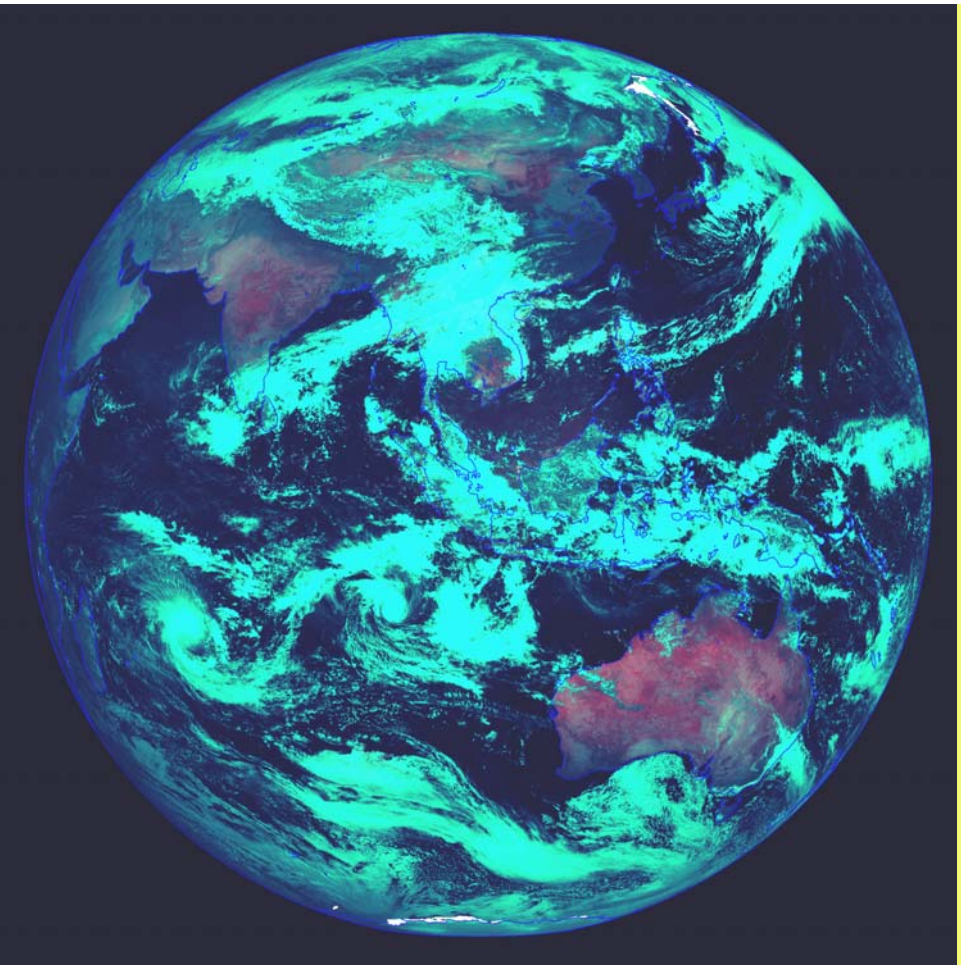


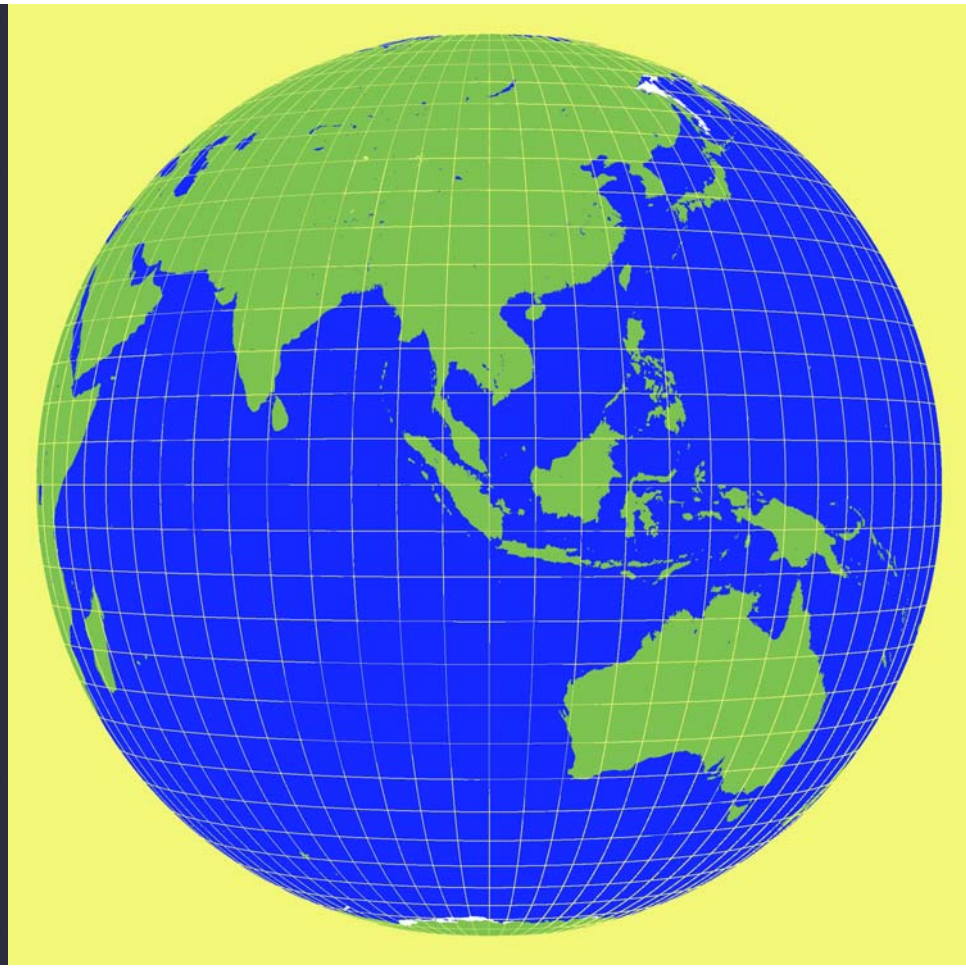
NOAA17 snowcover

2005□4□8□13□46

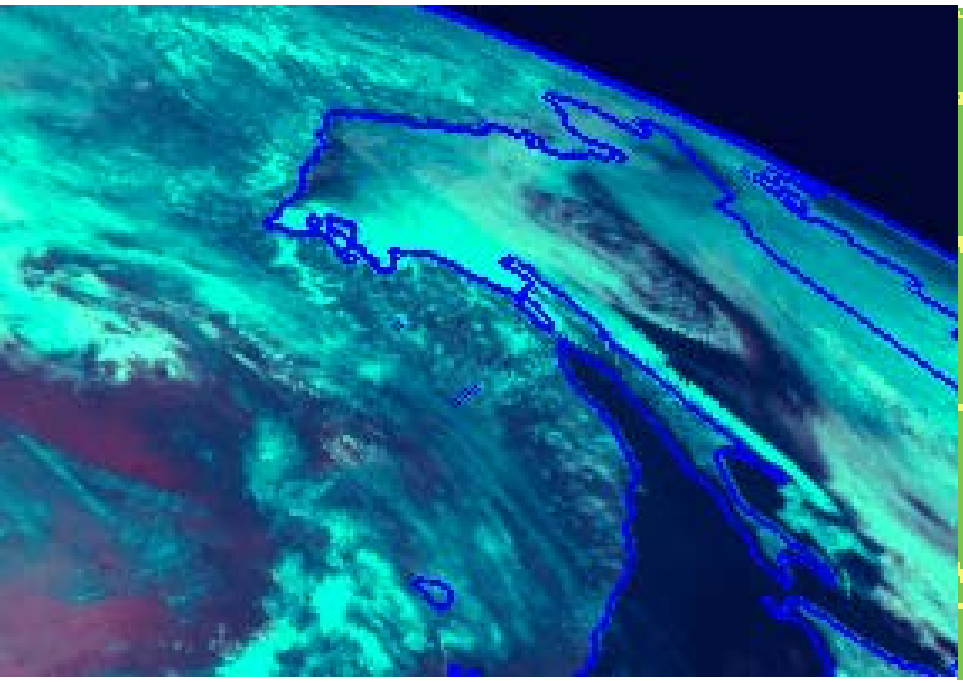


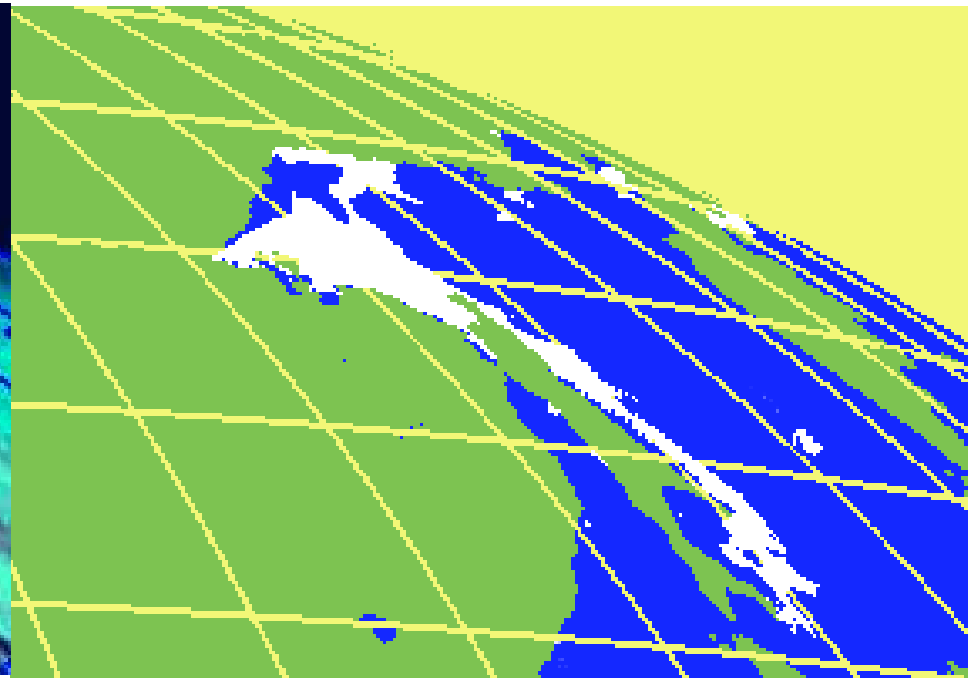
FY2C Sea Ice



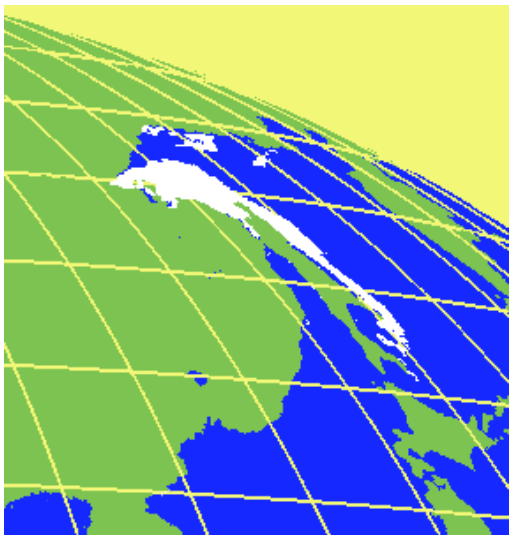


Regional Sea Ice

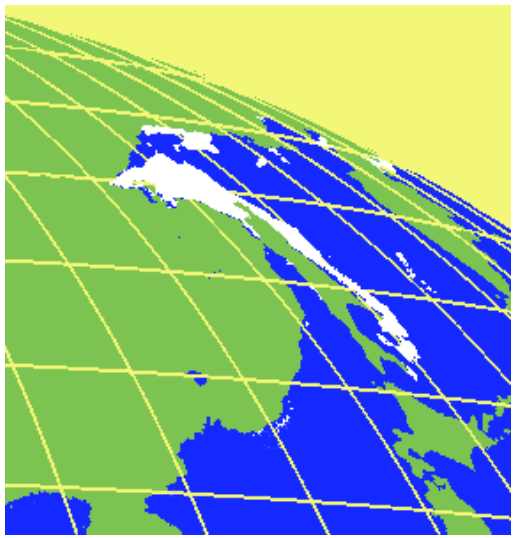




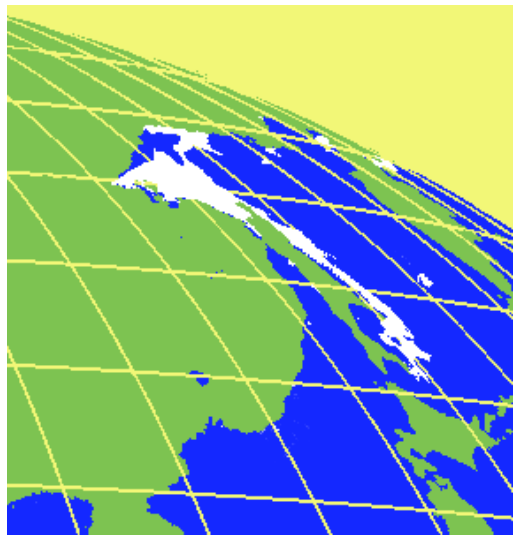
Regional Sea Ice(FY2C ,2005.04.04.0200~0700)



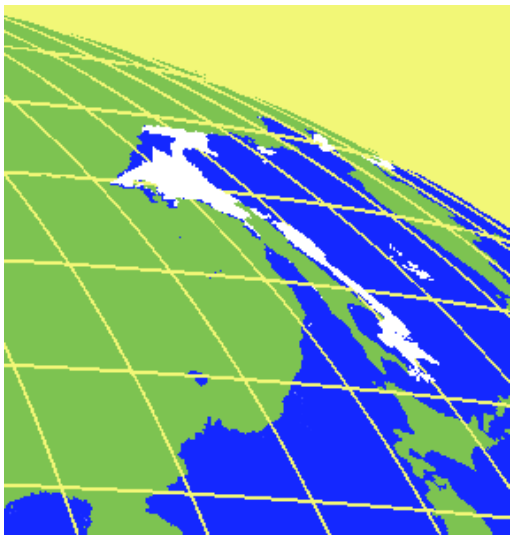
FY2C 2005/04/04/02:00Z



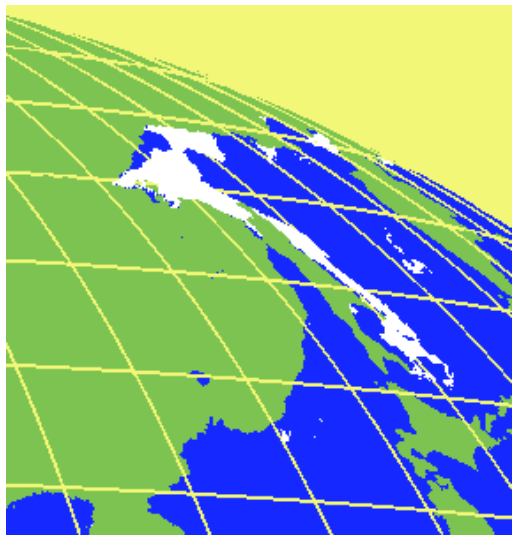
FY2C 2005/04/04/03:00Z



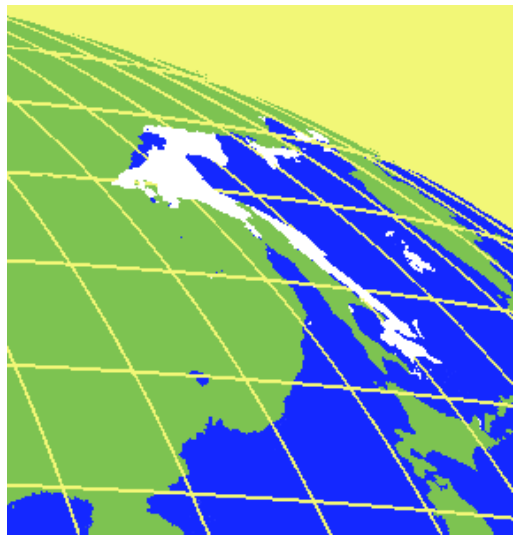
FY2C 2005/04/04/04:00Z



FY2C 2005/04/04/04:56Z

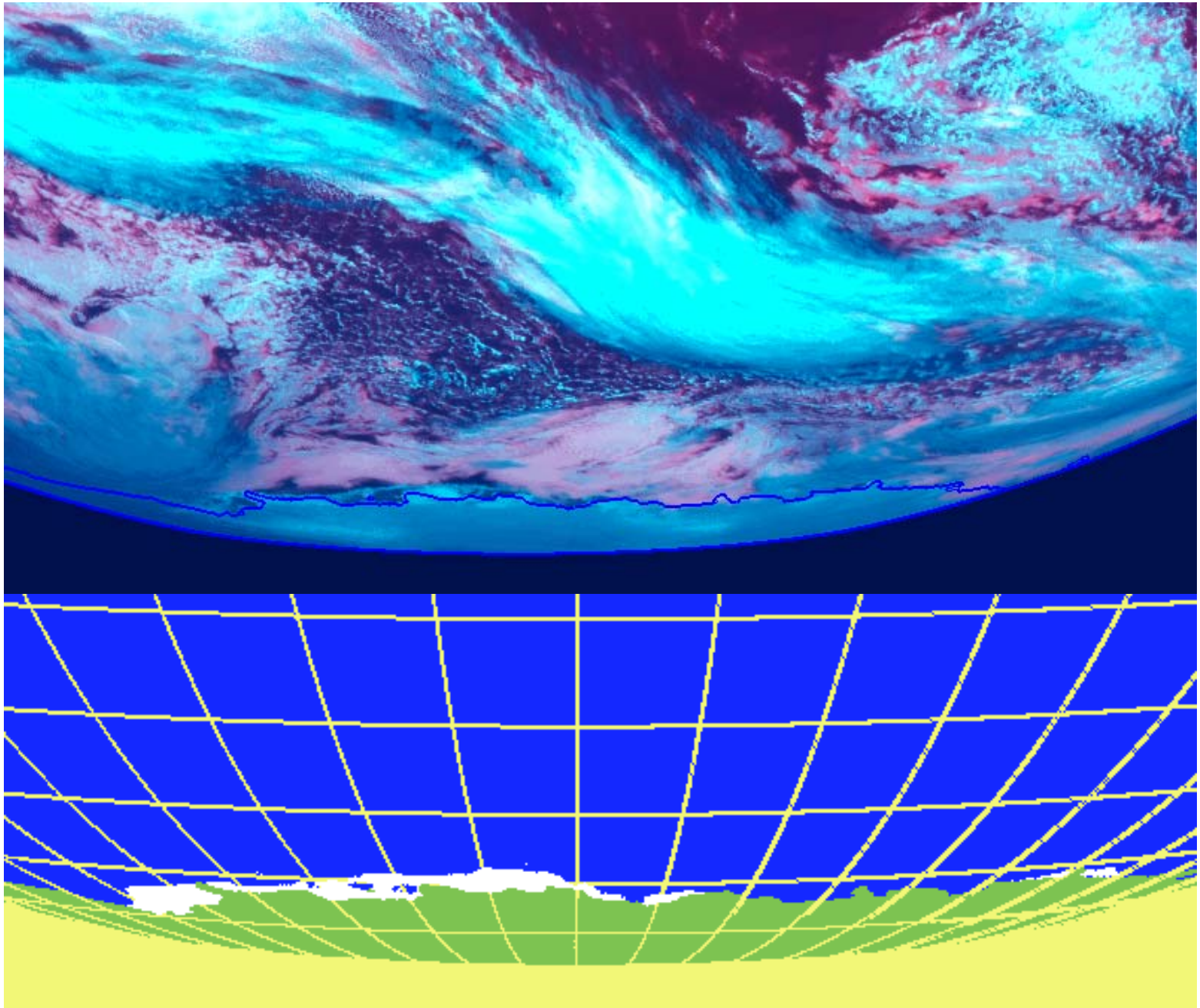


FY2C 2005/04/04/06:00Z



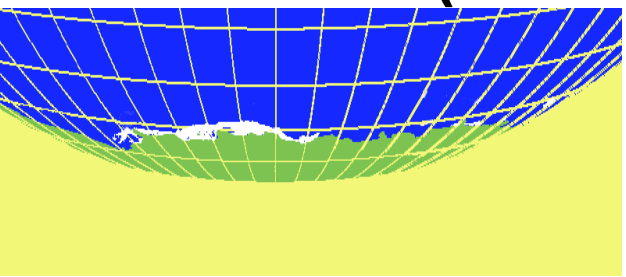
FY2C 2005/04/04/07:00Z

Regional Sea Ice □Antarctic□

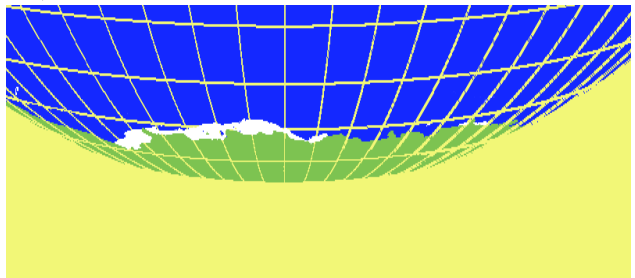


Regional Sea Ice □Antarctic□

(FY2C ,2005.04.04.0200~0700)



FY2C 2005/04/04/02:00Z



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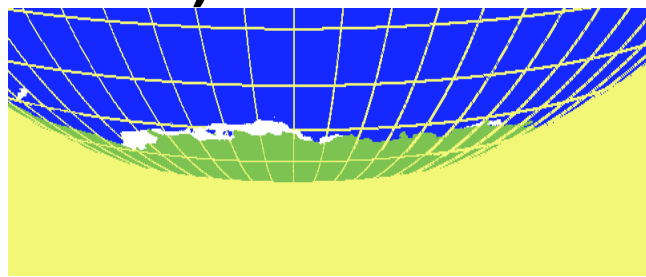

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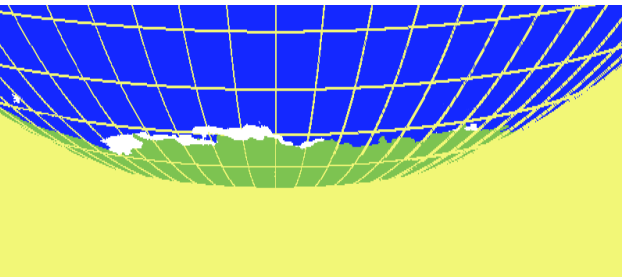

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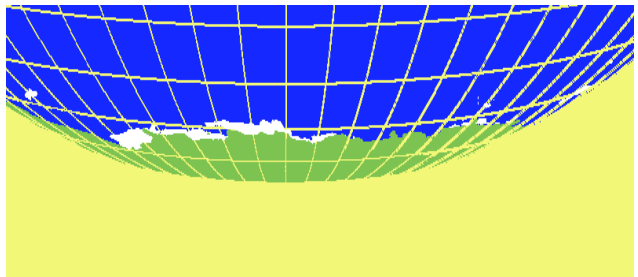

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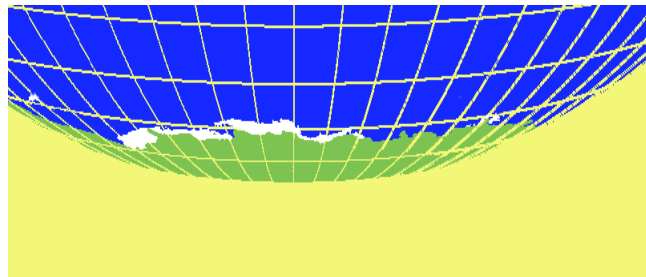

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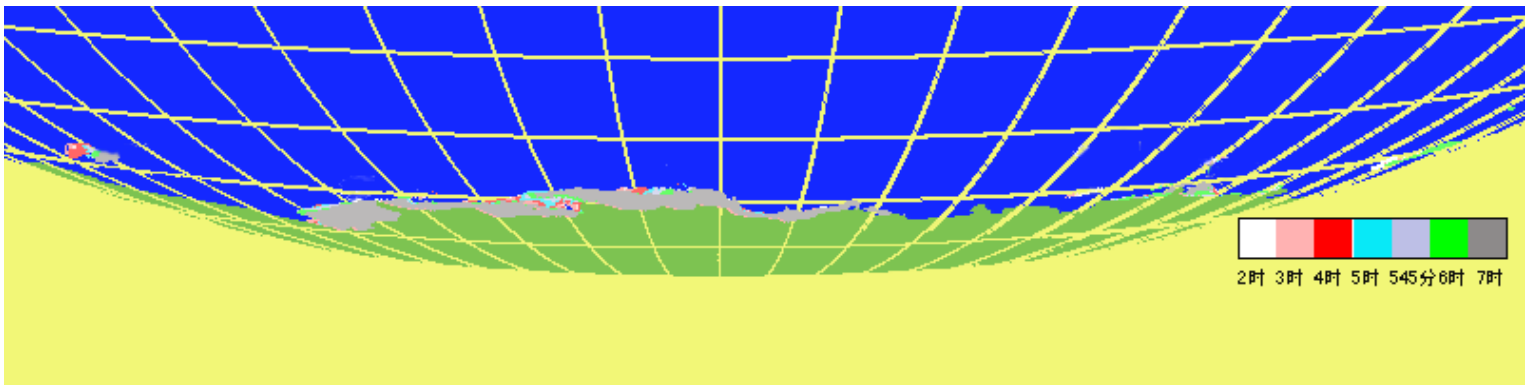

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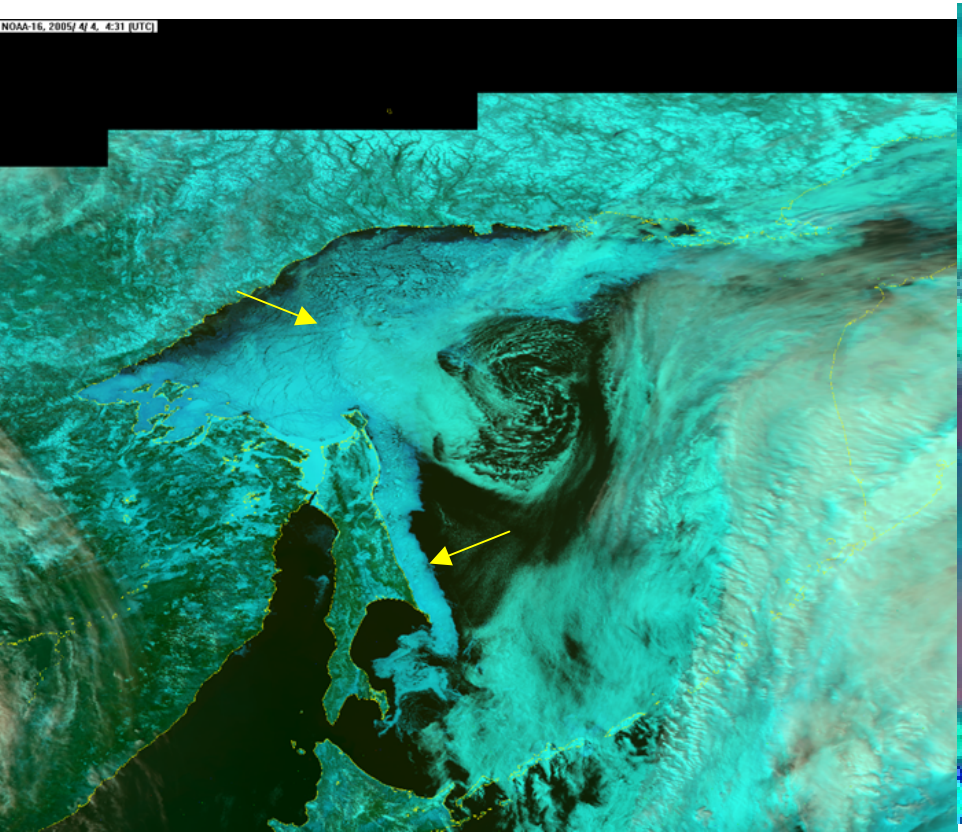
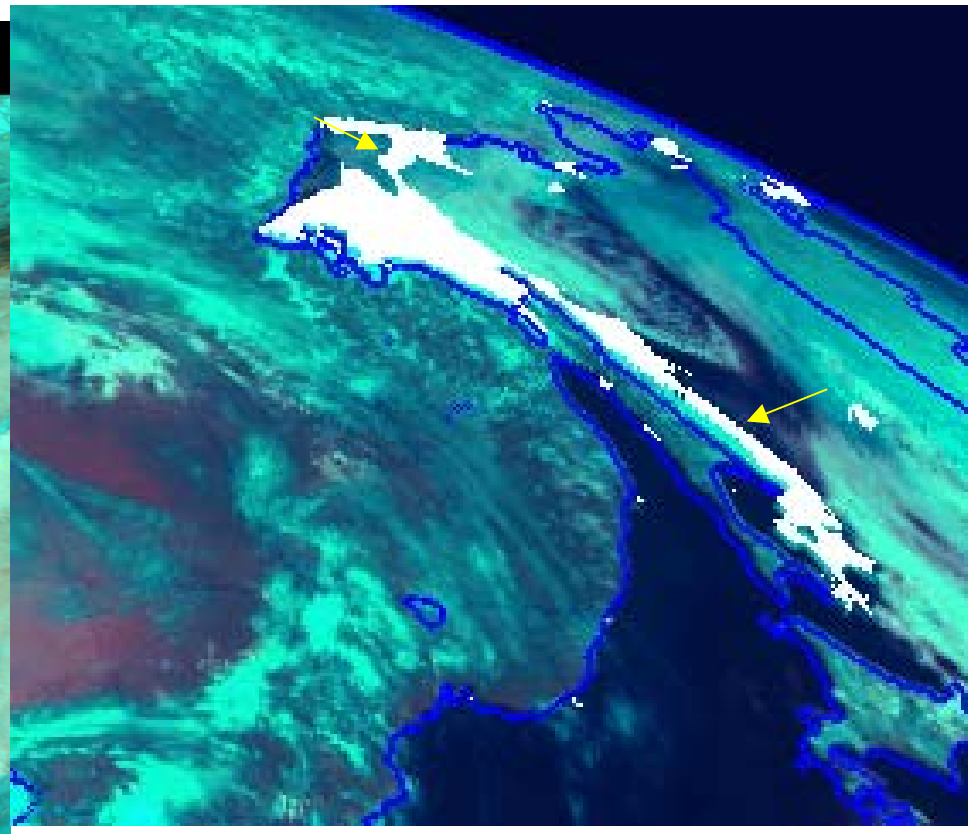
Sea ice compare with NOAA





NOAA-16 Sea ice

2005/04/04/04□31Z

FY2C Sea ice

2005/04/04/04□00Z

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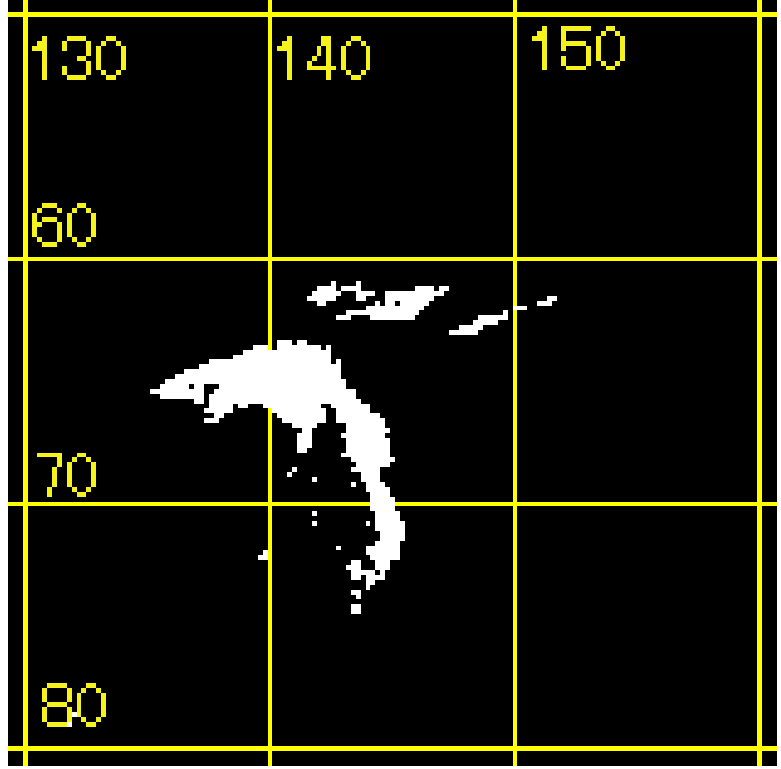
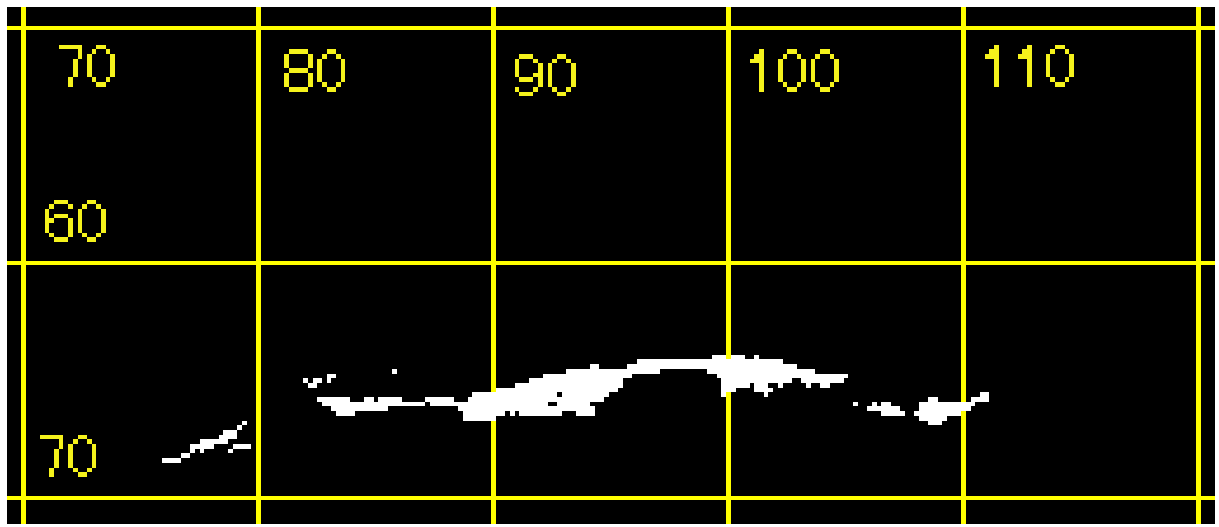
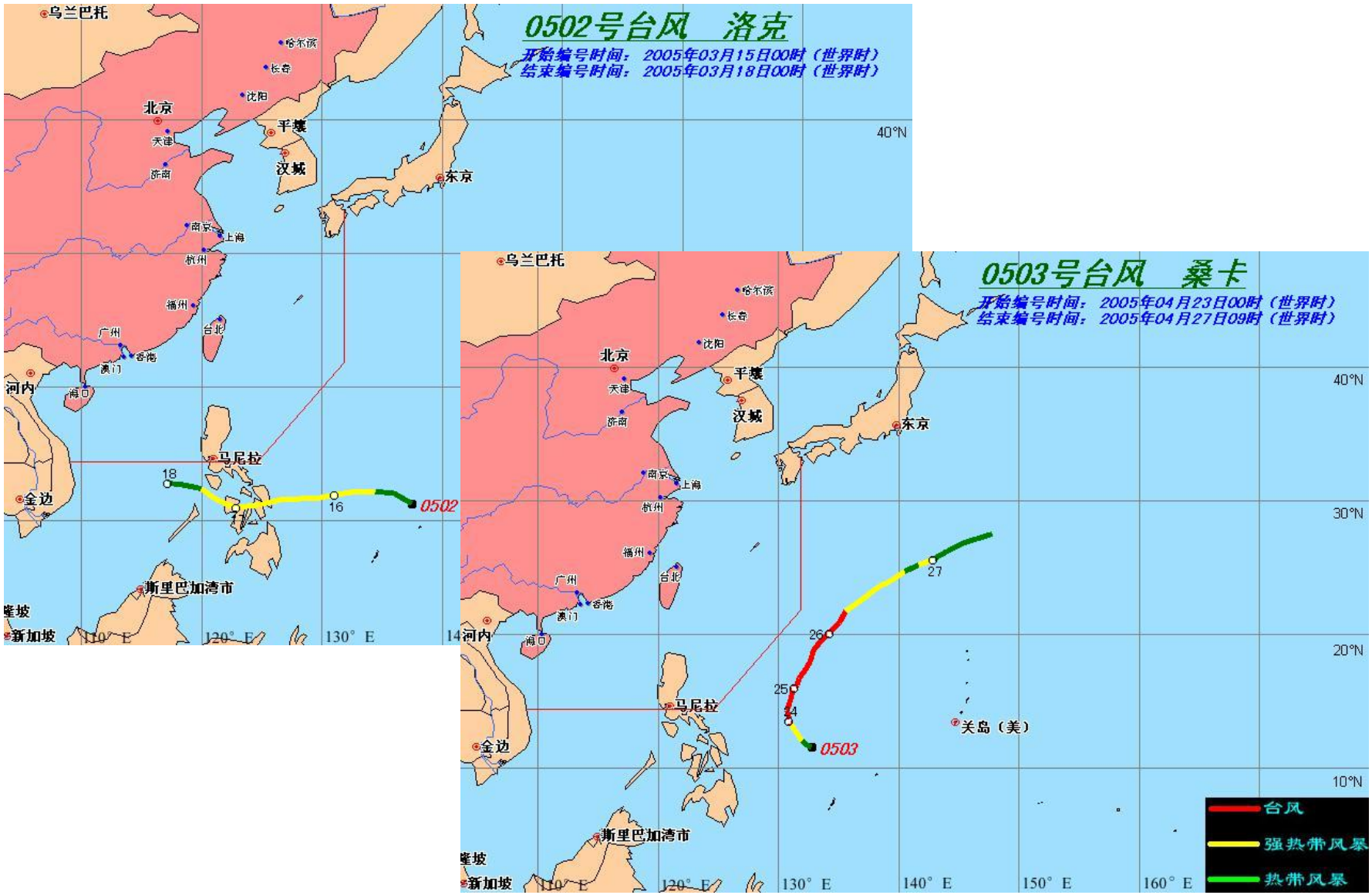
FY2C 2005/04/04/02:00Z

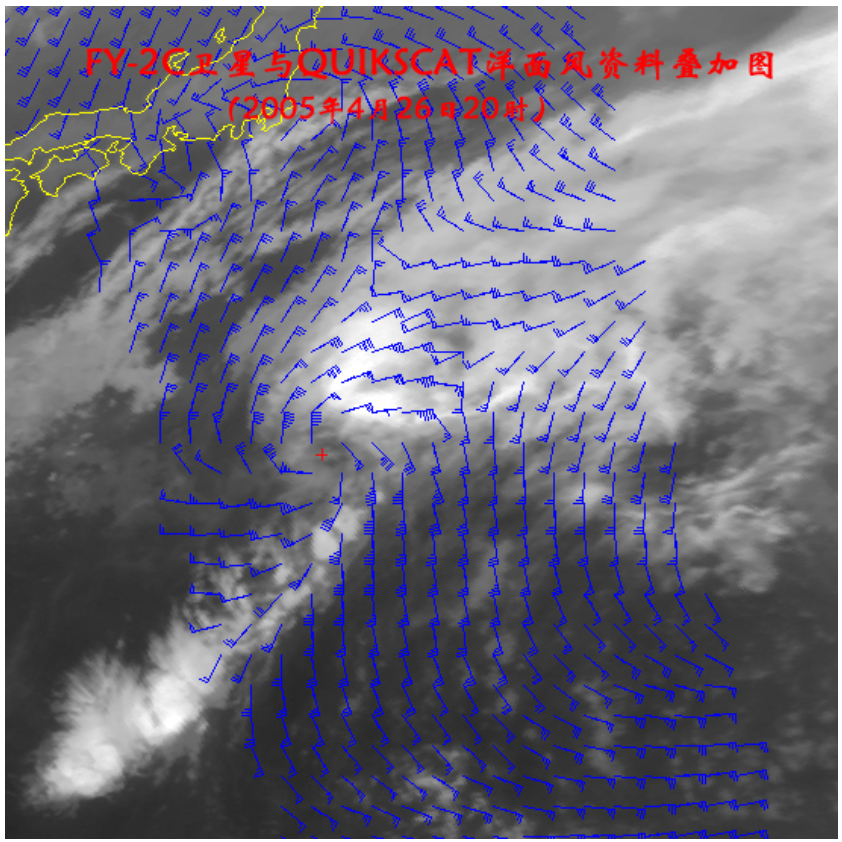


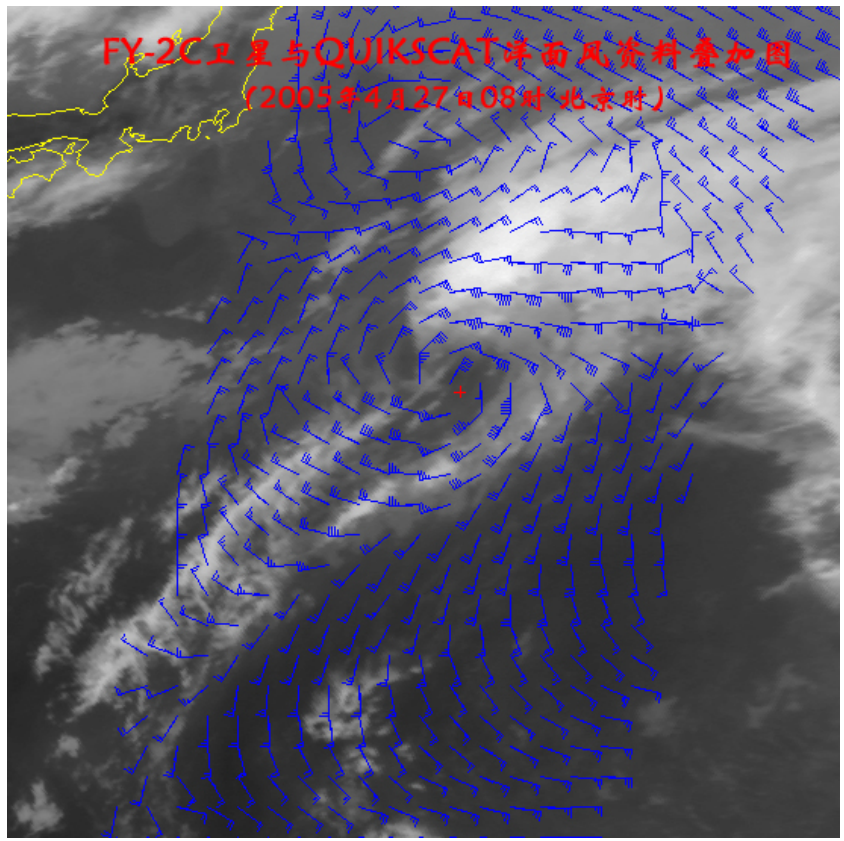


Tropical Cyclone

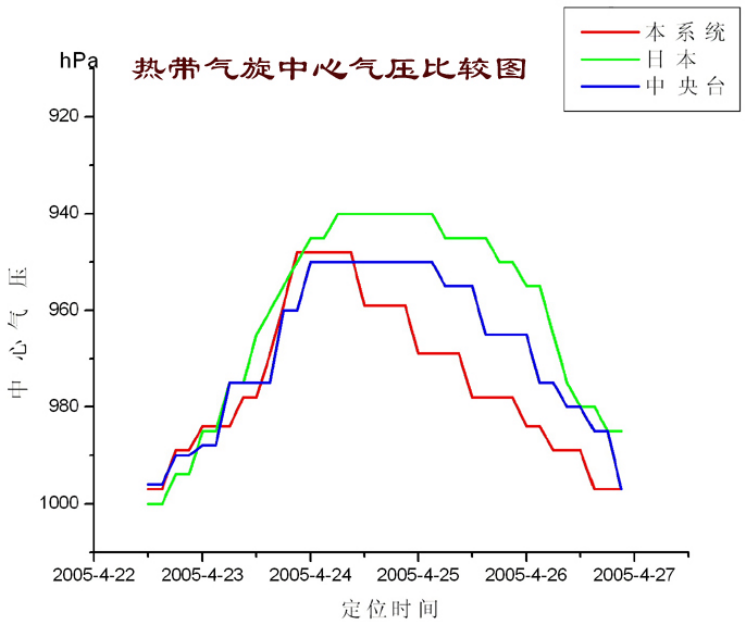


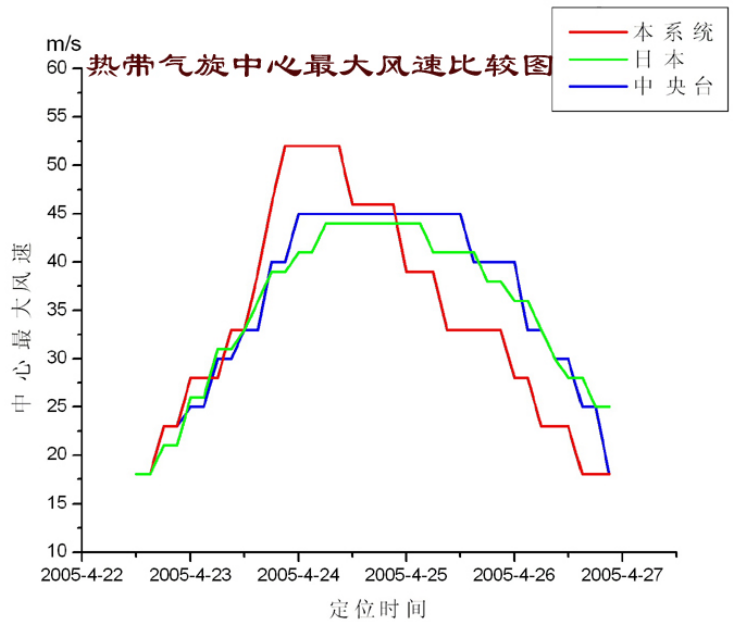
Tropical Cyclone position compared with QUIKSCAT



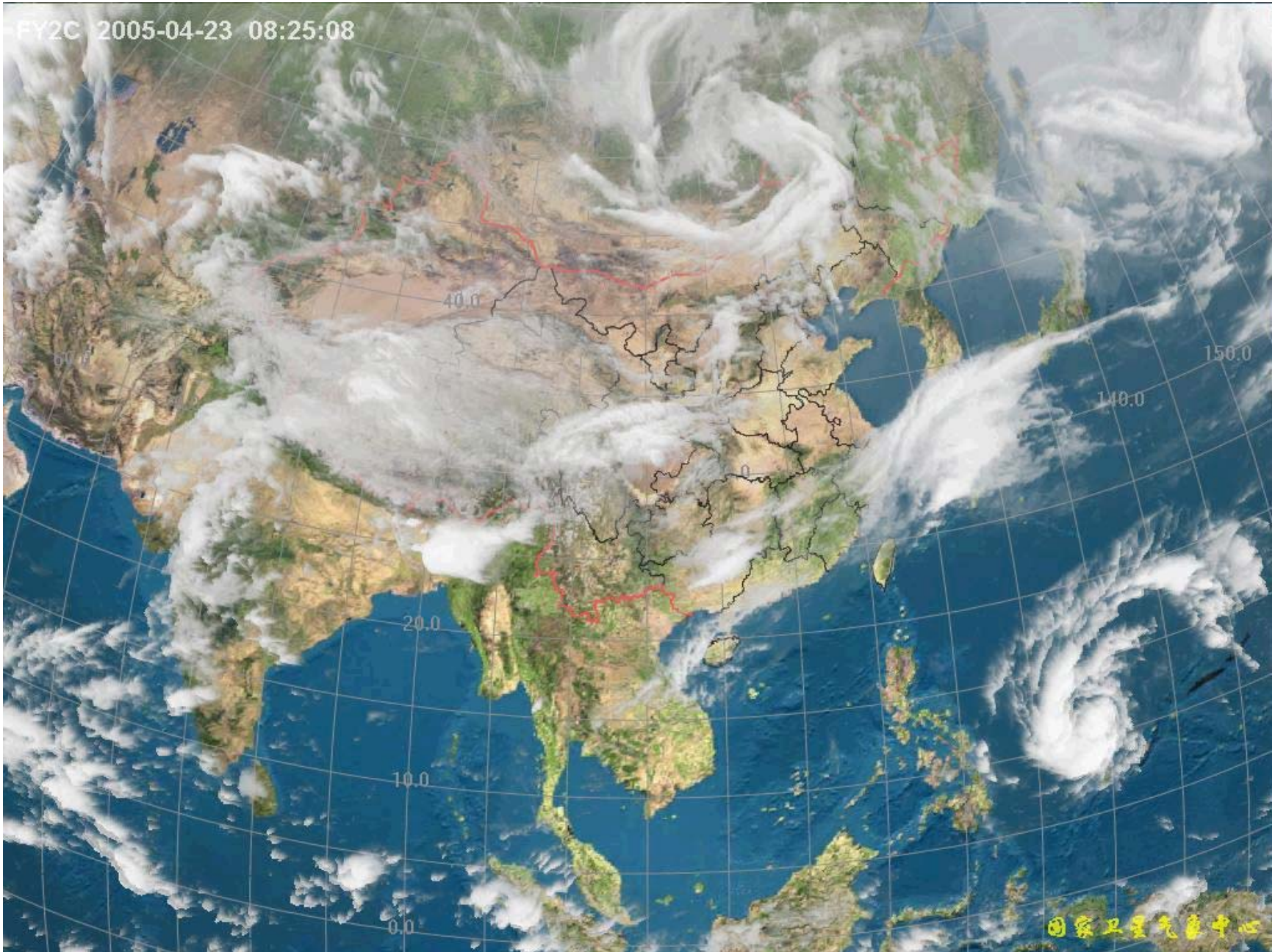


Tropical Cyclone Intensity Estimation





FY2C Image Broadcasted by TV



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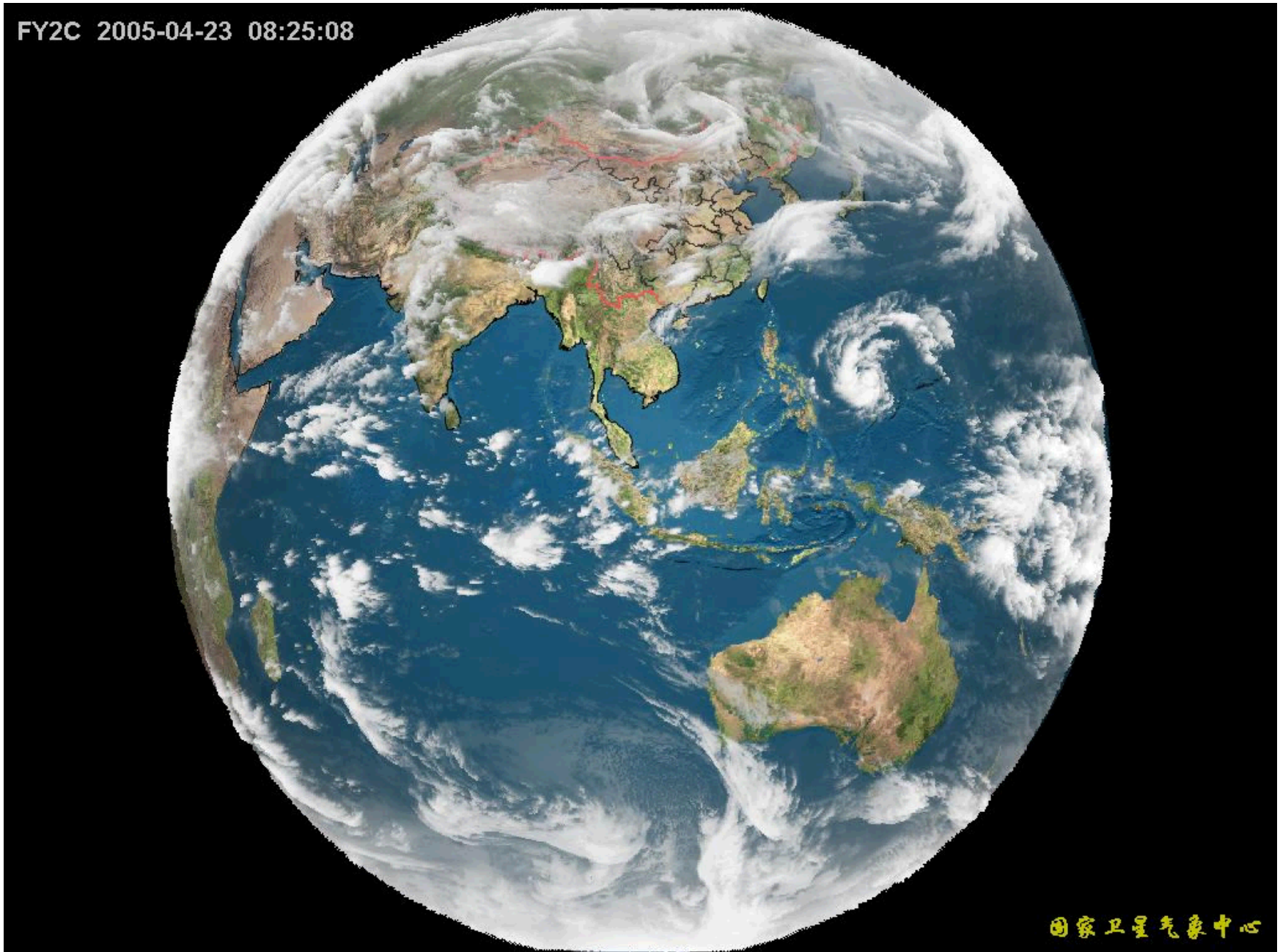

End

International TOVS Study Conference, 14th, ITSC-14, Beijing, China, 25-31 May 2005. Madison, WI, University of Wisconsin-Madison, Space Science and Engineering Center, Cooperative Institute for Meteorological Satellite Studies, 2005.