



Progress and Plan of China Xilinhote GRUAN works

Zhao Peitao

Email: peitaozhao@163.com

Meteorological Observation Center
(MOC) of CMA

2017-6-14

- 1、 Strategic work plan
- 2、 Operation level progress
- 3、 Technical reserve
- 4、 Successful Applications

1、 Strategic work plan

1.An important MEETING

2016-8-15, Meteorological Observation Center (CMA) and Inner Mongolia Meteorological Bureau held a meeting about the construction of Xilinhot GRUAN Station.

The outcome of the meeting for Xilinhot:

(1) A clear goal of Xilinhot : “super station test” with the benchmark climate observation, high-altitude meteorological observation operation test and research and training base.

1、 Strategic work plan

The outcome of the meeting:

(2) Clear responsibilities: MOC is responsible for the top-level design, planning and operation management system of Xilinhote GRUAN Station. Inner Mongolia Meteorological Bureau is responsible for coordinating the work with local government, the implementation of the tasks of the institutional staff.

1、 Strategic work plan

The outcome of the meeting:

(3) work planning: Work together to develop a work program. After being approved by the China Meteorological Administration, it will be implemented step by step. Priority will be given to the completion of the GRUAN station, and the implementation of the Xilinhote GRUAN station in 2020 will be effective.

1、 Strategic work plan

2. An important REPORT

After the meeting, An report was submitted to the China Meteorological Administration.

<Suggestions on launching GRUAN observation test to promote the development of China's high benchmark observation service>

Main contents : **Establishment** of vertical observation datum in China; **Promote** the construction of quality control system for sounding service; **Enhancing** the observation ability of upper air climate in China; Sounding observation **data quality inspection center** construction, enhance the high-altitude observation data service capabilities.

1、 Strategic work plan

2. An important REPORT

Main work measures:

Based on the operational comparison test of improved sonde, carry out the technical analysis and observation method of sonde;

Go to German GRUAN lead center to carry out radiosonde test and analysis;

Carry out Xilinhot GRUAN Observation experiments.

2、 Operation level progress

3.An important GROUP

Established the sounding key technology Innovation team.
Committed to GRUAN work.

7 persons, Yang RongKang is Chief Expert.

十、探空关键技术创新团队成员

1.首席专家：杨荣康（高级工程师）

2.团队队员：

探测中心：赵培涛（高级工程师）、郭启云（高级工程师）、

崔喜爱（工程师）

空军第七研究所：徐磊（高级工程师）

上海物管处：隋一勇（工程师）

新疆气象技术装备保障中心：徐新明（助理工程师）

中国气象局气象探测中心人事处文件

气探人发〔2016〕43号

关于确定气象观测标准体系研究 等12个创新团队成员的通知

各单位：

经研究，确定气象观测标准体系研究、GNSS/MET 观测及应用、风场与降水场组合技术、雾霾观测、天气雷达技术、天气雷达实时质控技术、风廓线雷达观测及应用、雷电观测及应用、农业气象观测技术、探空关键技术、天气雷达产品、激光雷达探测技术等12个创新团队成员如下：

一、气象观测标准体系研究创新团队成员

1.首席科学家：郭亚田（正研级高级工程师）

2、 Operation level progress

3.An important Engineering

China has launched the FY-3 launch program. FY -03 Meteorological satellites:4, the first one will launched near 2018year.

FY -03 Meteorological satellite Application system Engineering.

Construction of satellite product inspection super station based on benchmark observation at Xilinhote, with Ground - based remote sensing observation network, Funding initially estimated at about 40 million CNY.

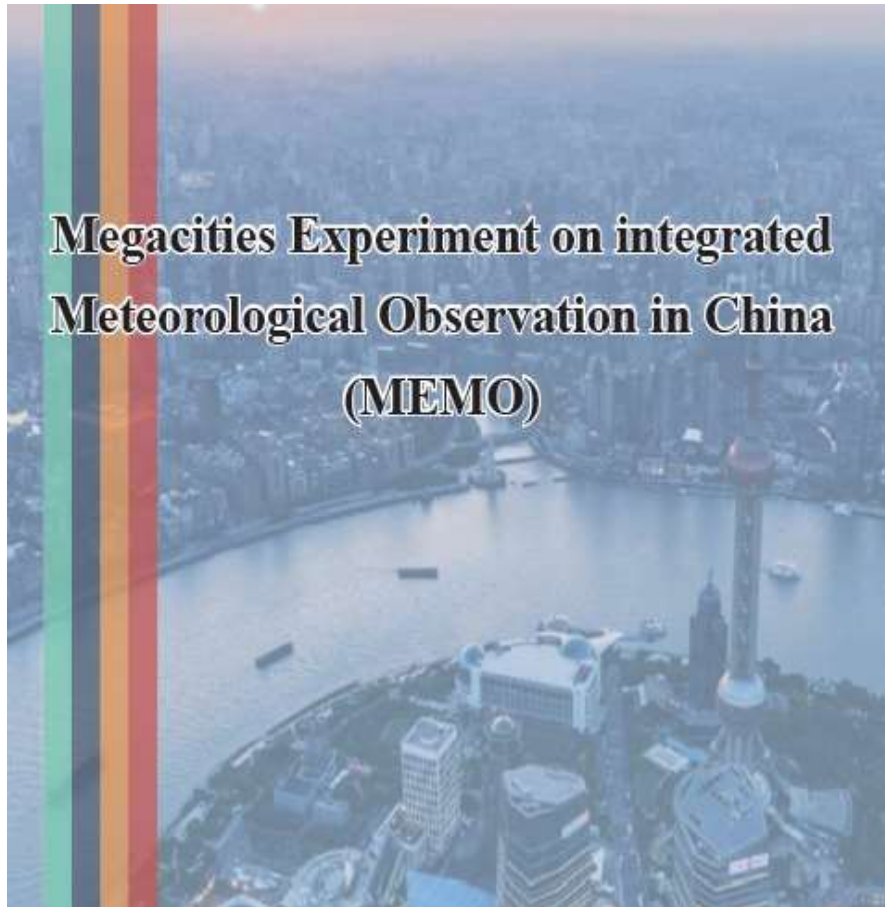
2、 Operation level progress

Xilinhot station main work:

- 4 times a day the **radiosonde observation** profiles provide temperature and moisture uncertainty analysis.
- once a week **vaisala RS92/RS41** the world's best radiosonde observation results.
- 1 times a month of temperature and **water vapor scientific radiosonde observation** profile, providing the highest level of accuracy of the profile, error of temperature are less than 0.2, the humidity is less than 5%.
- **Weekly ozone** sounding observations.
- hourly **GNSS/MET** observations provide uncertainty analysis.
- monthly **vertical profiles** of SO₂, NO₂, PM_{2.5} and PM₁₀.
- provide ground-based benchmark radiometric observations per hour, providing uncertainty analysis.

2、 Operation level progress

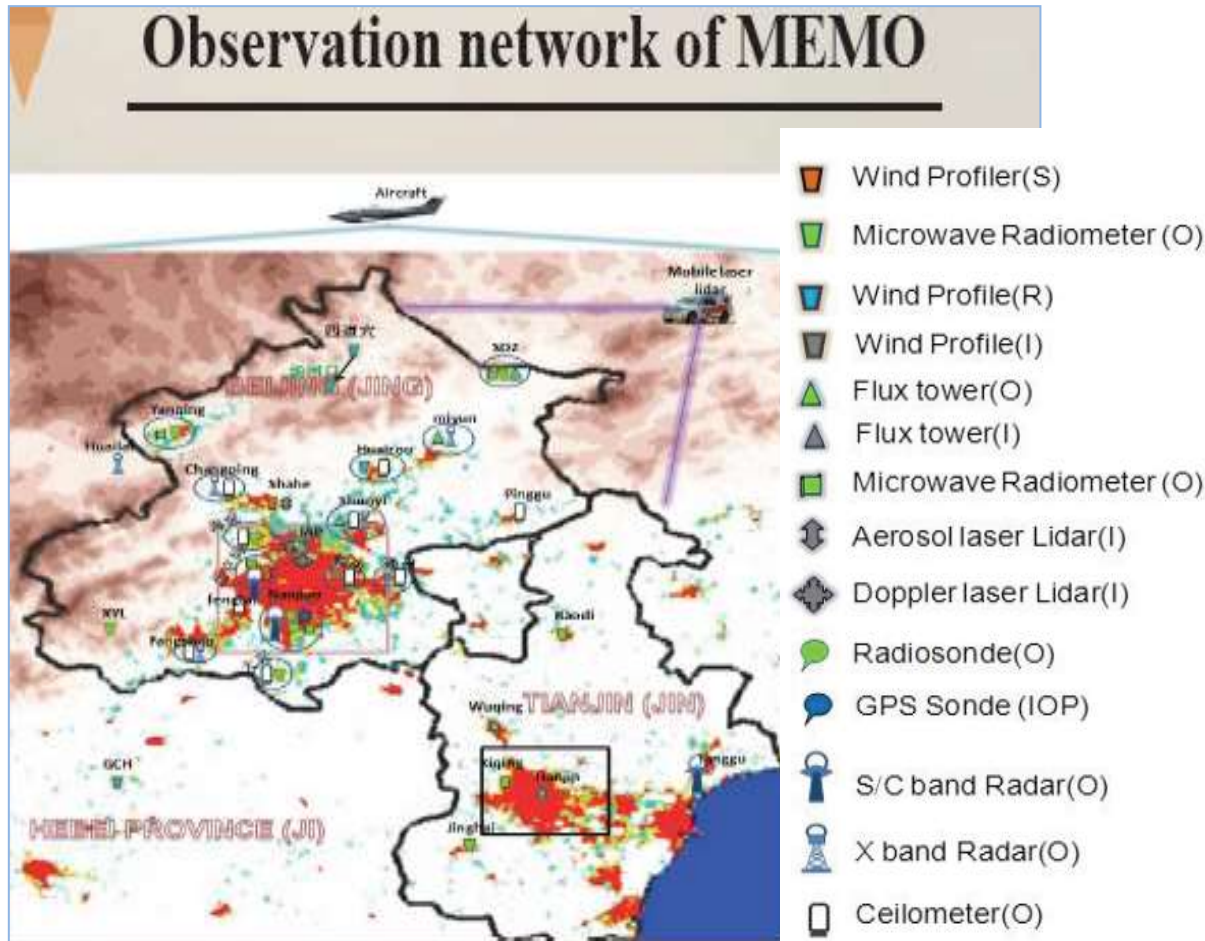
4. An important Experiment



MEMO is initiated by China Meteorological Administration (CMA) and organized by CMA Meteorological Observation Centre (MOC). The experiment takes place in Beijing Tianjin Hebei region, Shanghai, Guangzhou, Chengdu, Shenyang, Xi'an and Shenzhen. Over a period of three years (2016~2018) of the trial, it will effectively improve the overall quality of meteorological observation data and model assimilation rate, and establish the interaction mechanism of observation and forecast, solve the key technical problems in the short term and the environment weather service as well.



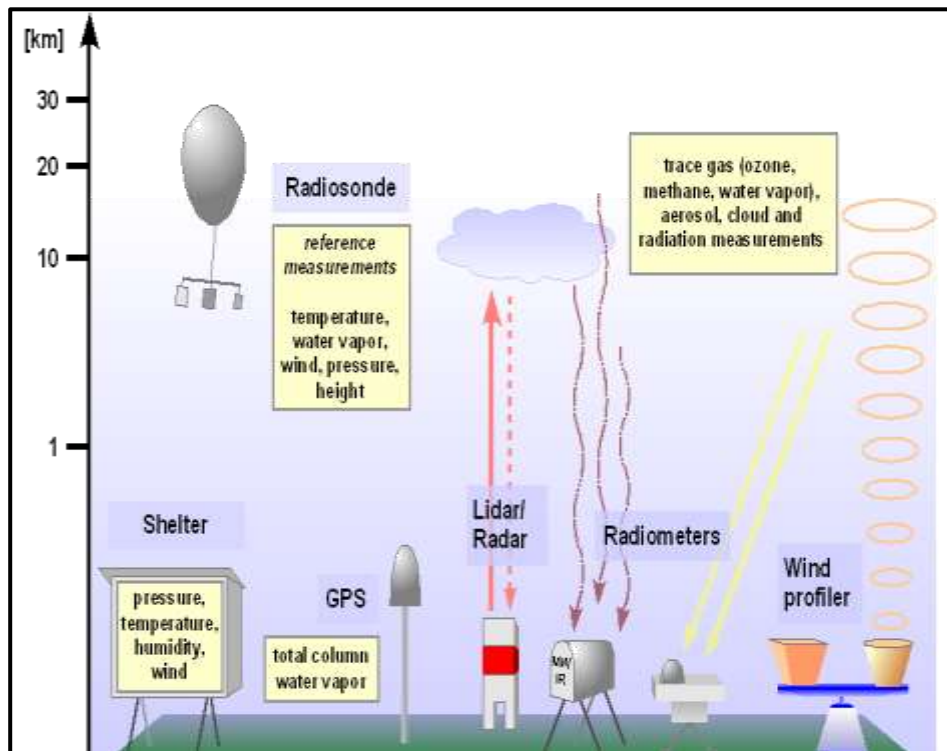
2、 Operation level progress



Multiple observation equipments
Integrated data processing applications

3、 Technical reserve

MEMO technical concept is consistent with GRUAN observations



Priority 1: Temperature, pressure, water vapour

Priority 2: Ozone, methane ...

Several 'Observing findings':

Vertical characteristics of atmospheric boundary layer
 '5 profiles': wind vector, temperature, humidity, hydrometeor and aerosol
 Urban heat island effect

Operational generation

system of real-time

atmosphere 3-D

objective analysis fields

Newly produced and improved

data make important

contribution to forecast result

of numerical models through

assimilation

Technical standards,

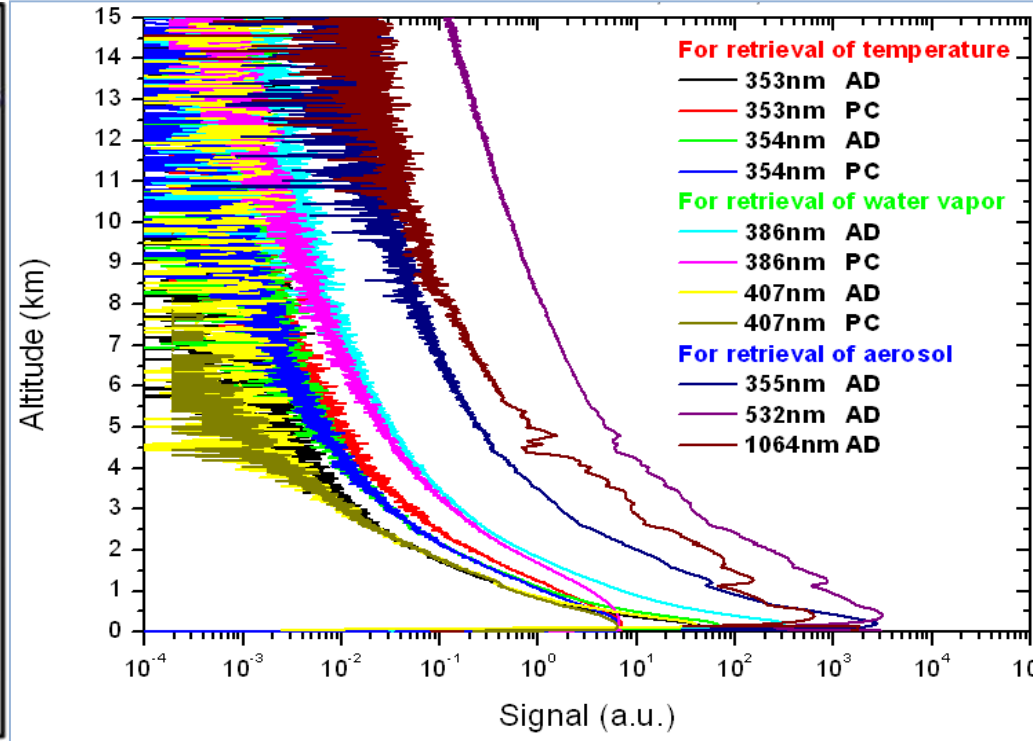
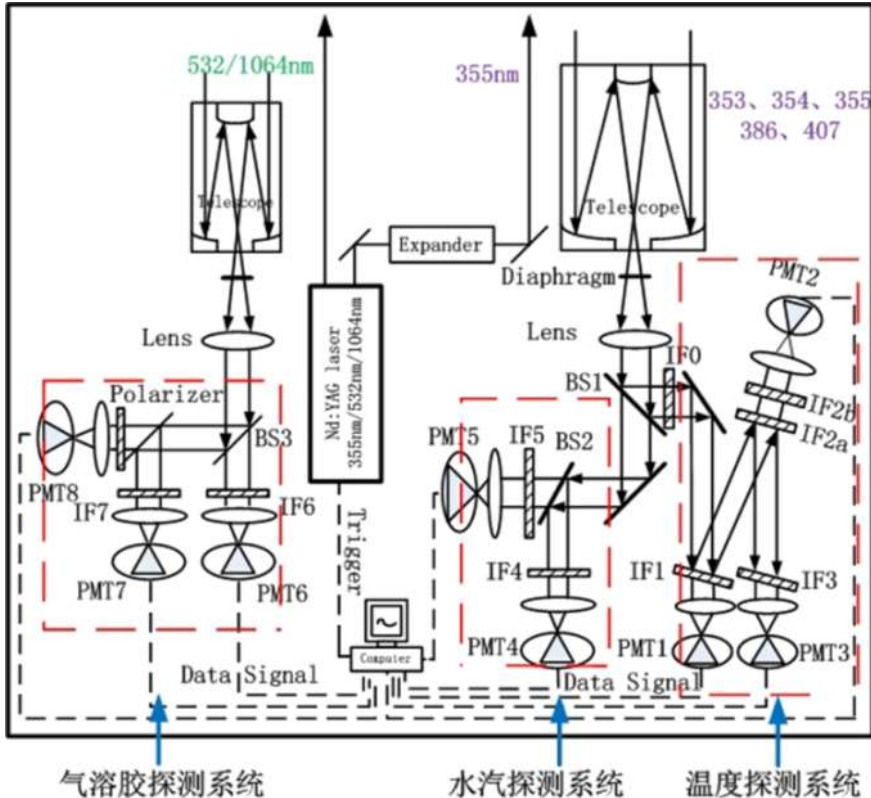
specifications and

processes of cooperative

observation

3、 Technical reserve

Development and Application: Temperature-water vapor-aerosol Lidar used in MEMO.

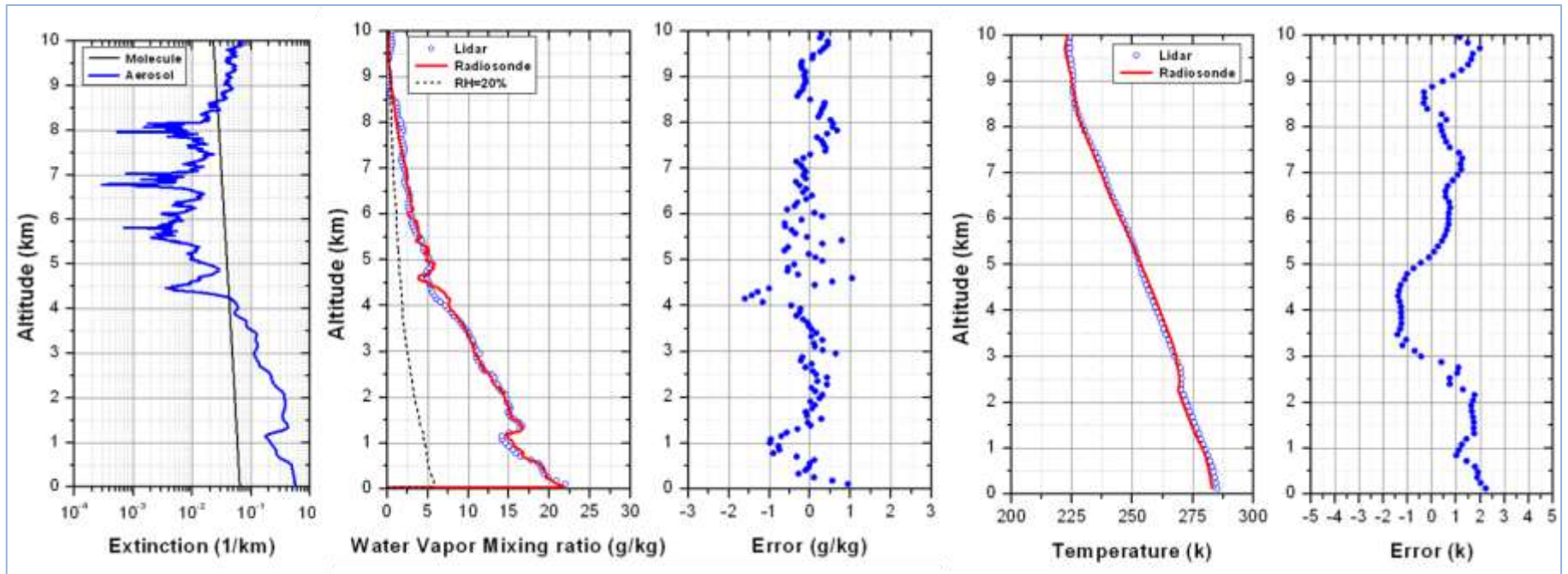


Transmitted: 3 wavelengths; Received: 7 wavelengths;

Detected: 11 Signals

3、 Technical reserve

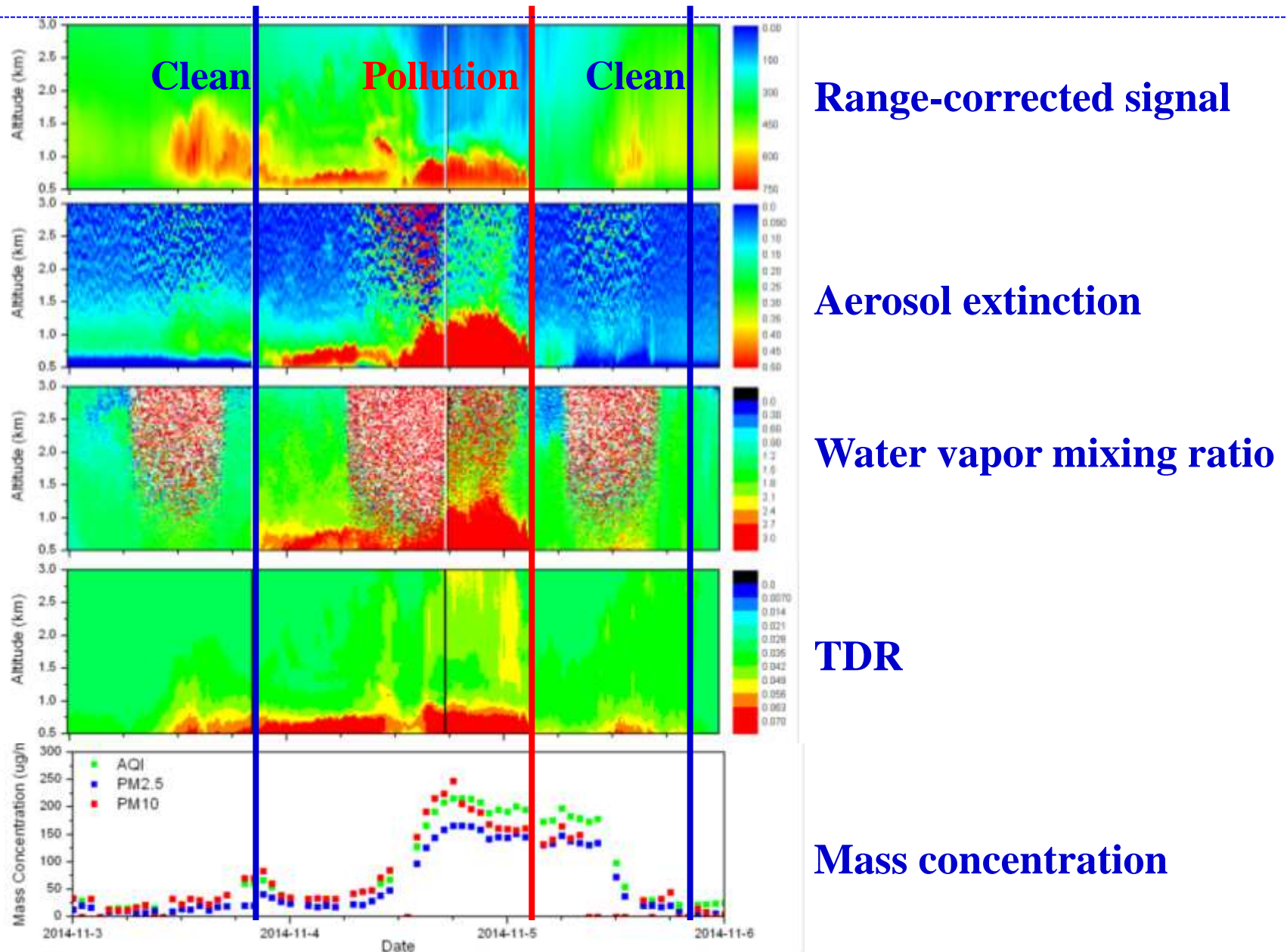
Vertical profiles of aerosol extinction coefficient, water vapor mixing ratio and temperature observed with Raman lidar in association with radiosonde data.



Range resolution: 7.5m
Detection range: 0-10km

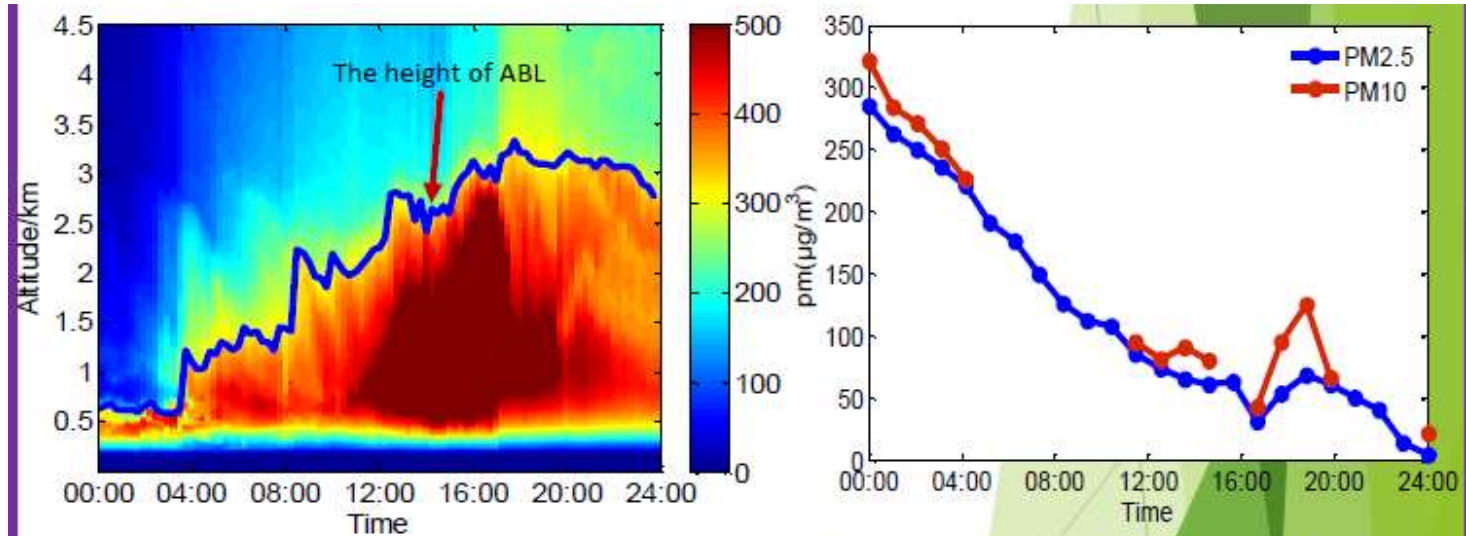
Temporal resolution: 5min
Error: 1g/kg @10km
1k @PBL, 3k@2.5-9km

4、 Successful Applications

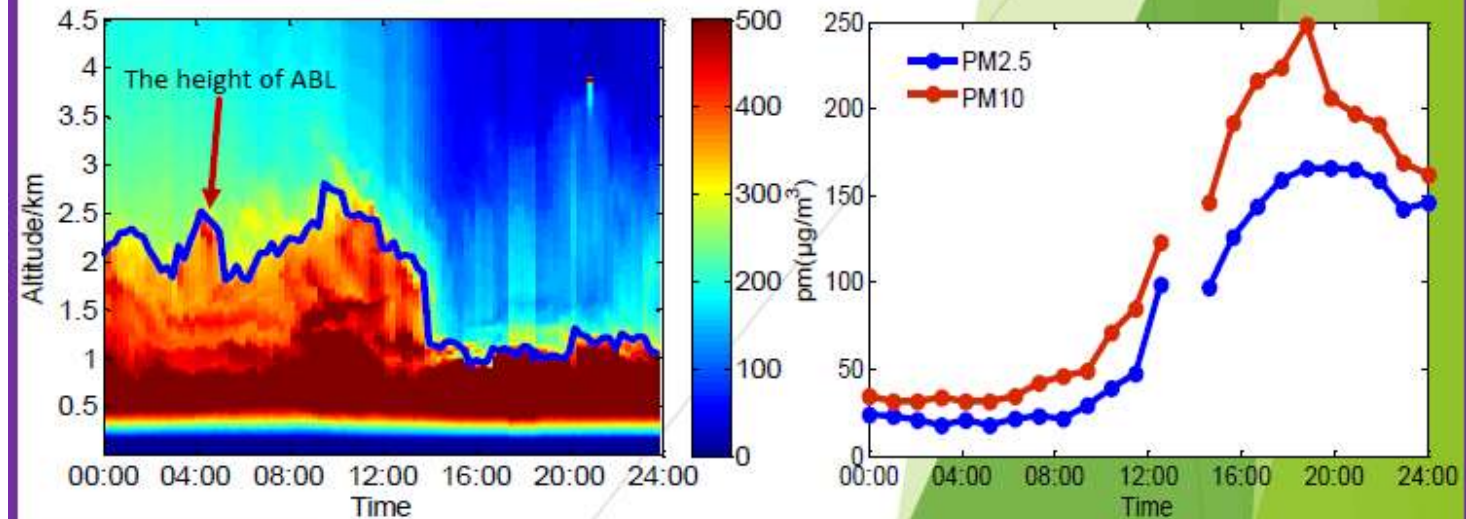


4、 Successful Applications

Negative correlation between the height of ABL and mass concentration

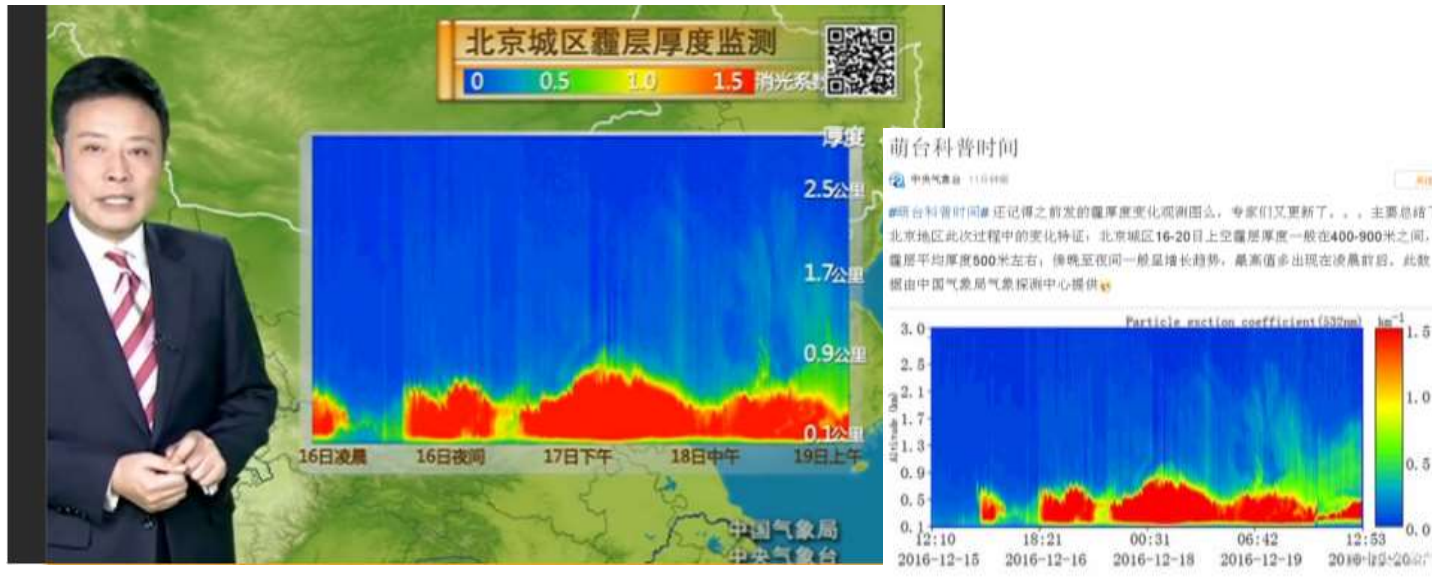


The height of ABL has negative correlation with the concentration of surface PM_{2.5}



4、 Successful Applications

A very famous national weather forecast program use aerosol products by lidar observed ,and other Media.



Lidar detection had made great progress in continuous observation of aerosol/water vapor/temperature profile, so can provide sufficient technical support for Xilinhot GRUAN station.

Thanks for your attention!