



Metrology Service of RIC-Beijing

Zhao Xu

National Centre for Meteorological Metrology
(NCMM/RIC-Beijing)

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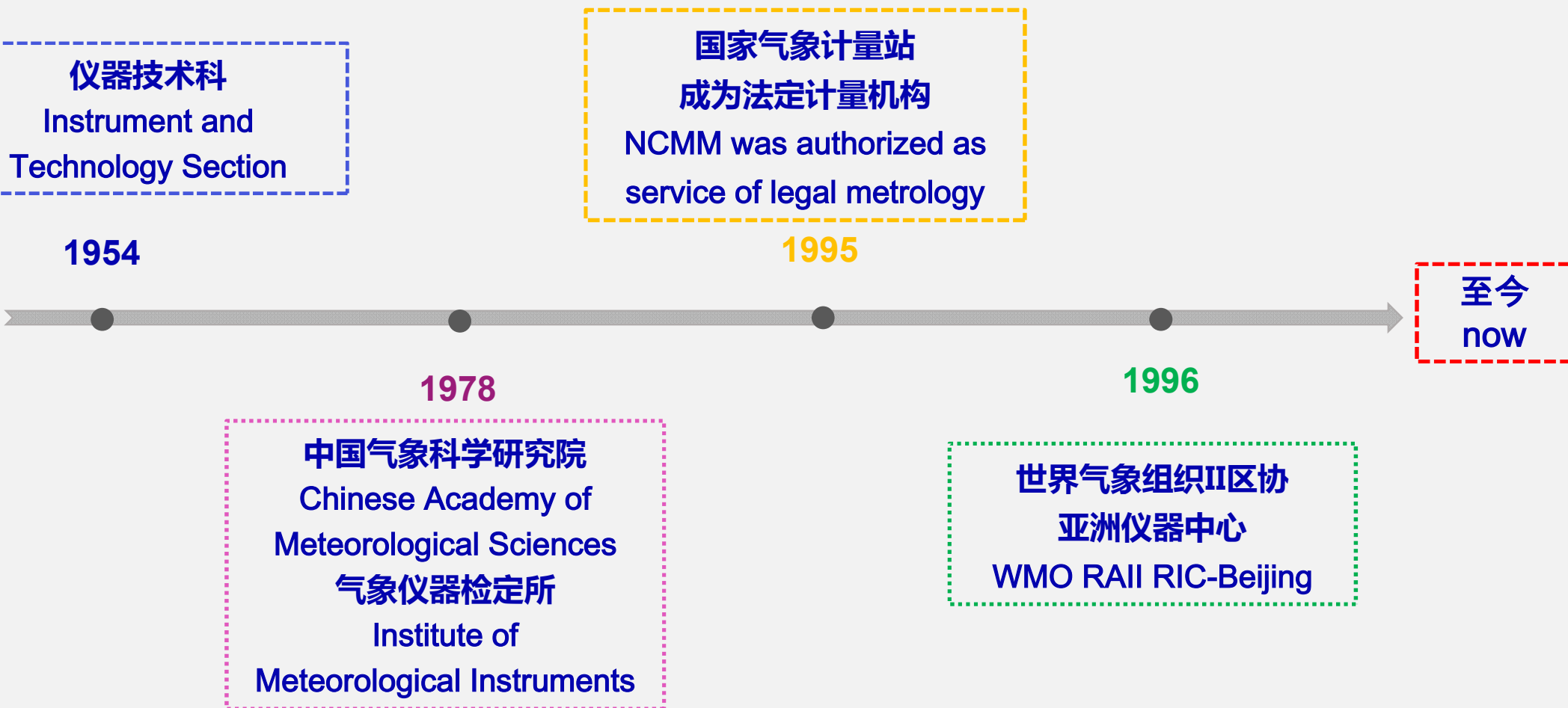
PART 01

关于我们

About Us



Development History



仪器技术科
Instrument and
Technology Section

1954

国家气象计量站
成为法定计量机构
NCMM was authorized as
service of legal metrology

1995

中国气象科学研究院
Chinese Academy of
Meteorological Sciences
气象仪器检定所
Institute of
Meteorological Instruments

1978

世界气象组织II区协
亚洲仪器中心
WMO RAII RIC-Beijing

1996

至今
now

Beijing ★

- Atmospheric Pressure Laboratory
- Meteorological Temperature Laboratory
- Meteorological Humidity Laboratory
- Atmospheric Electrical Laboratory
- Precipitation Laboratory
- Atmospheric Optical Laboratory
- Solar and Terrestrial Radiation Laboratory

Beijing ★

- Air Velocity Laboratory
- Precipitation Chemistry Lab
- Meteorological Instrument Type Evaluation Lab
- Soil Moisture Lab
- Greenhouse Gas Standard Metrology Lab
- Aerosol Metrology and Analysis Laboratory
- Reaction Gas Metrology and Analysis Laboratory
- Precipitation Chemistry Laboratory

Xi'an Shaanxi ●

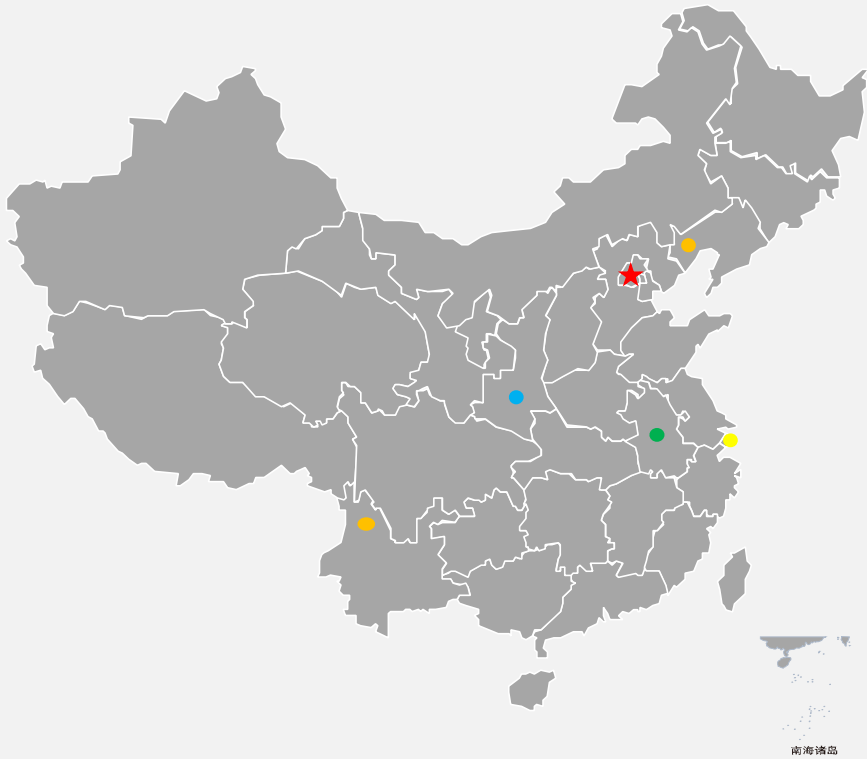
High Speed Wind Laboratory

Shanghai Hefei, Anhui ●

Visibility Laboratory

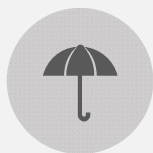
Lijiang, Yunnan Kazuo, Liaoning ●

Radiation Measurement Comparison Field





国家气象计量站 NCMM



计量资质 Measurement Qualification



名称



名称



名称



PART 02

能力和服务

Ability & Service



The Main Business

| Instrument Undergoing Calibration | Calibration Range | Reference Standard, Equipment | Calibration and Measurement Capability (CMC)* |
|--|--|--------------------------------------|--|
| Pt Resistance Thermometers | -60 to +80 °C | First-class SPR Thermometer | U=0.05 °C |
| Hygrometers | (5 ~ 98)%RH | Precision Dew-point Hygrometer | U=(0.4 ~ 1.5)%RH |
| Digital barometers | 100 to 1200 hPa | Gas Piston Pressure Gauge | U=(1 ~ 4)Pa |
| Wind direction and Wind speed sensor | 0.2 to 70 m/s | Pitot tube | (2 ~ 40) m/s U=0.08 m/s (40 ~ 60) m/s U=(0.08 ~ 0.18) m/s |
| Rain gauge | 0 to 942.48 mL | Standard Capacity Measures(glass) | MPE: ± (0.031 to 0.314) mL |
| Pyrheliometer | (5 ~ 15) $\mu\text{V}/(\text{W}/\text{m}^2)$ | Cavity Radiometer | U _{rel} =0.6% |
| Pyranometer | (5 ~ 25) $\mu\text{V}/(\text{W}/\text{m}^2)$ | Secondary Standard Pyranometer | U _{rel} =1.6% |

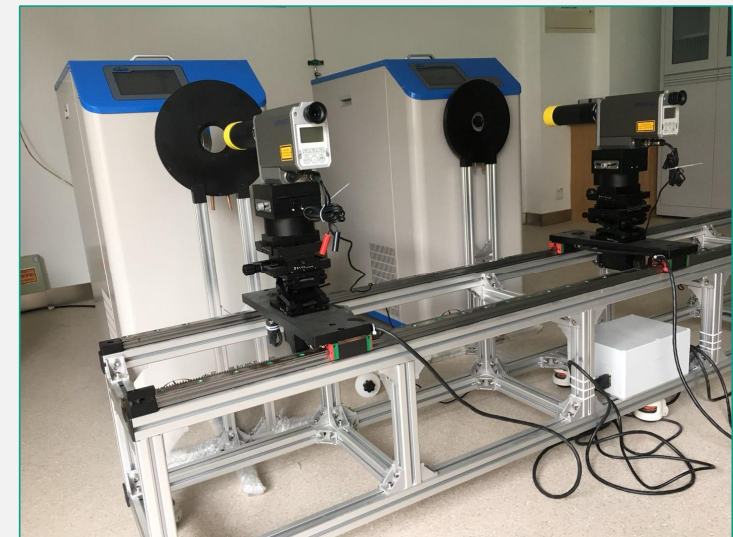


Temperature Lab



First-class SPRT standard

SPRT, Thermometer bridge, Temperature bath
CMC: $U=0.05^{\circ}\text{C}$
To cal.: standard mercury in glass thermometer,
digital Pt-thermometer, AWS sensor



Temperature primary standard

Liquid nitrogen comparator (-196°C)
Mercury triple point (-38.8344°C)
Water triple point ($+0.01^{\circ}\text{C}$)
Gallium melting point ($+29.7646^{\circ}\text{C}$)
Indium freezing point ($+156.5985^{\circ}\text{C}$)



Blackbody temperature standard

Long-wave blackbody, radiation
thermometer, SPRT, Thermometer bridge
To calibrate: standard blackbody,
radiation thermometer for field surface
temperature



Humidity Lab



Dew-point hygrometer standard

Chilled mirror DP, split flow humidity generator, climate chamber

CMC: $U=(0.4\sim 1.5)\%RH$

To cal.: second-class standard ventilation psychrometer, AWS humidity sensor

D.P. hygrometer calibration device

D.P. generator, SPRT, high accuracy Chilled mirror;

Working range: $(-70\sim +70)^{\circ}C$ D.P.

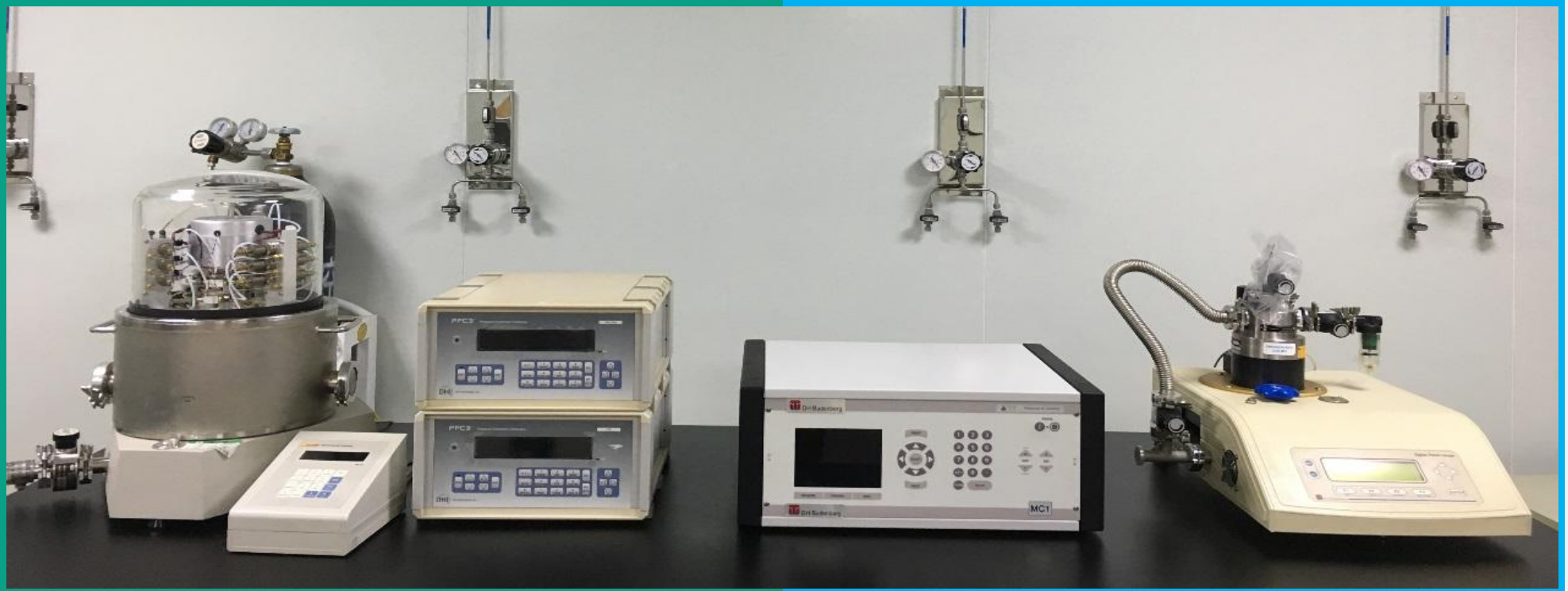
MPE: $\pm(0.05\sim 0.1)^{\circ}C$ D.P.

H





Air Pressure Lab



PG7601 gas piston pressure gage

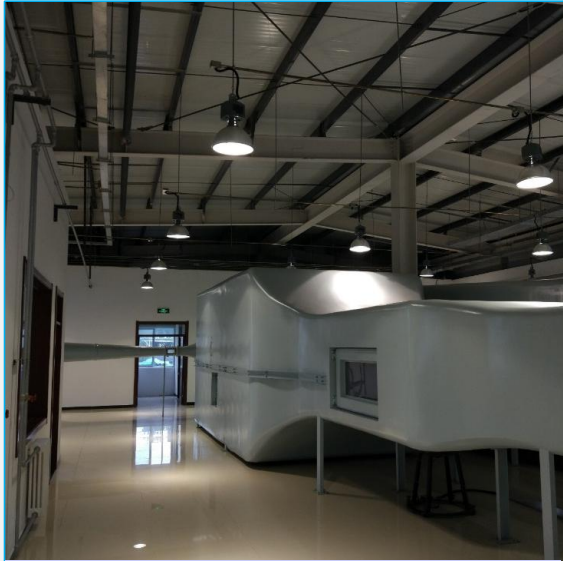
- To cal.: standard digital barometer, air presser sensor
- Working range: (100~1200) hPa; CMC: $U=(1\sim4)\text{Pa}$

FPG8601 gas piston micro-pressure gage

- Working range: (1~150) hPa,
- To serve upper-air observation system



Air velocity Lab



**70m/s wind tunnel
Beijing**



**Very low speed wind tunnel
Beijing**



**90m/s wind tunnel
Xi'an, Shaanxi**

- Standard device of air velocity includes first-class Pitot tube, micro-manometer , and wind tunnel.
- To cal.: second-class Pitot tube, 3-cup anemometer, propeller anemometer, Thermal anemometer, Ultrasonic anemometer, wind direction sensor
- The new 90m/s wind tunnel has been built at Xi'an city Shaanxi province. Now it is in test running and soon will join into measure system and expand the working range of air velocity lab.



Precipitation Lab

F1-class weight standard



- Top standard of CMA for precipitation that unified weight method and capacity method in precipitation measure.
- To cal.: F2-class weight, electronic balance, second-class capacity measure (glass)





Precipitation Lab



Rain gage calibration device

Capacity method

- To cal. Tipping-bucket rain gage, weighting rain gage, siphon rainfall recorder
- Range: (0.1~30)mm
- MPE: ± 0.04 mm





Solar and Terrestrial Radiation Lab



太阳辐射标准装置
Solar radiation standard

- HF Cavity Radiometer, AHF Cavity Radiometer, PMO6 electrical substitution radiometer
- Value tracked to WRC (Davos)
- To cal. : pyrhelimeter, pyranometer



太阳模拟器及多维转台
Solar simulator and Multi-rotation platform

- Radiometer indoor testing device
- To test directional response, cosine response, tilt response, nonlinear and temperature response



International Cooperation



Mongolia



Vietnam



Pakistan



D.P.R. Korea



International Cooperation



Metrology Training



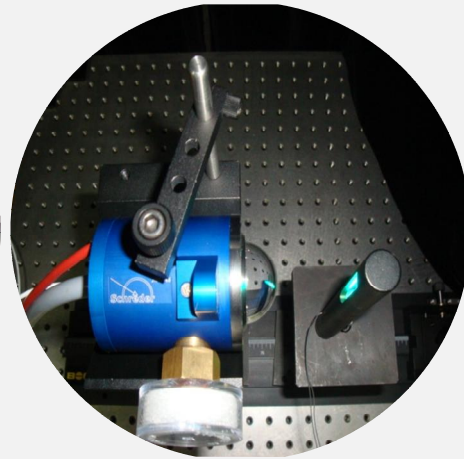
PART 03

展望未来

Look Ahead



Solar and Terrestrial Radiation Lab



紫外和光合有效辐射标准装置 ultraviolet radiation & photosynthetically active radiation standards

双单色仪光谱辐射计、标准灯、光学平台组成的光合和紫外辐射标准装置，标准灯溯源到中国计量院，可用于校准紫外辐射表和光合有效辐射表等

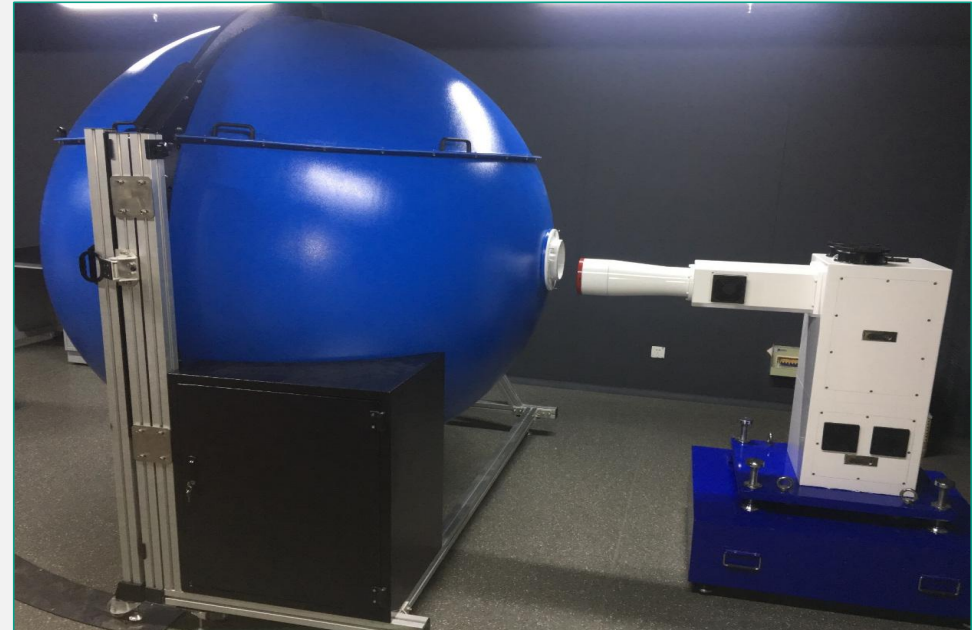


Solar and Terrestrial Radiation Lab



长波辐射黑体装置 Long-wave radiation blackbody device

- Consisted by radiation blackbody, SPRT, thermometer bridge
- To calibrate long-wave radiometer (pyrgeometer)



日照计校准装置 sunshine recorder calibrator

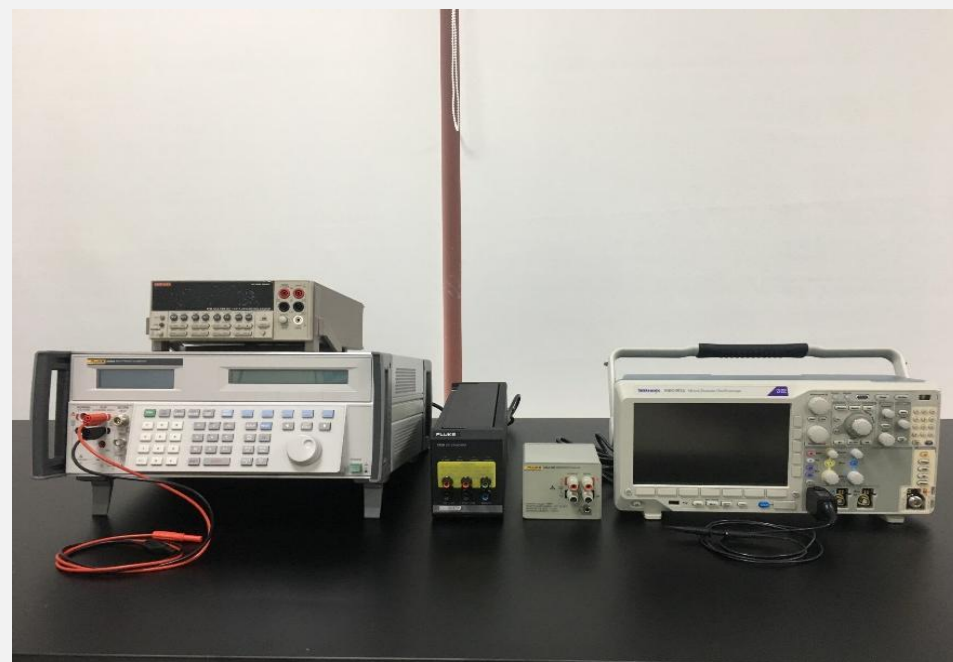
- Consisted by integrating sphere, solar simulator, multi-rotation platform
- To calibrate sunshine recorder



Air Electrical Lab



大气电场校准装置
Atmospheric electric field instrument testing device



数据采集器校准装置
AWS Datalogger calibration device



Visibility Lab



能见度模拟仓

Simulation Chamber of Visibility



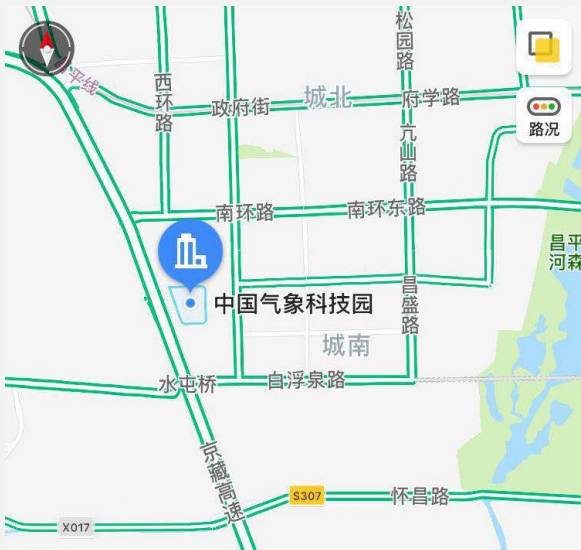


Establishment metrology ability for new types observation equipments

- ◆ Establish optics lab and calibration ability for visibility meter and laser cloud altimeter;
- ◆ Establish electromagnetic lab and test ability for lightning locator;
- ◆ Research and develop weather phenomenon simulation technology for Weather phenomena instrument;
- ◆ Automate the soil moisture standard;
- ◆ Establish length lab and calibration ability for evaporimeter and Snow depth meter.



Contact Us



NCMM / RIC-Beijing:

地址：北京市昌平区振兴路2号中国气象科技园2号楼

ADD: Building 2, No.2, Zhenxing Road, Changping District, Beijing, China

电话/传真：010-68409323

PHONE/FAX: 086-10-68409323

ZHAO Xu:

PHONE: 086-10-68400493

E-mail: zxaoc@cma.cn

Mobile/WeChat: +86-15810227573



Thank you for your listening!

Look forward to your advice!

