

# Cloud Radar in China

Gao Yuchun, Li Zhe  
Meteorological Observation Centre of China Meteorological Administration,  
No. 46, Zhongguancun South Street, Haidian District, Beijing, China.  
Tel: +8613601296761  
Email: [gycaoc@cma.gov.cn](mailto:gycaoc@cma.gov.cn)

## Abstract

This paper briefly introduces the application of cloud radar technology in China and various types of cloud radars manufactured by Chinese domestic producers as well as examples obtained in observation experiments.

### 1. Development of cloud radar in China

At present, cloud radar detection technology is in good development in China and radar producers show great enthusiasms in it by providing specifically designed radars based on user requirements. Nowadays all the cloud radars mainly play a role in scientific research and operational experiment while there is still not demand in cloud radar for pure operational use.

At the beginning, cloud radar adopts vacuum tube technique, including magnetron, travelling wave tube, klystron and so on. With the advance of solid state technique, cloud radar using solid state transmitter is developed. In addition, from a perspective of observation mode, there is a transition from single polarization to dual polarization, from vertical pointing to scanning, from ground-based to airborne-based observation, as well as from Ka-band to W-band.

In addition to single wavelength observation, cloud radar system adopting dual wavelength (Ka-band and W-band) is under development. Appearance of several types of cloud radar is shown in fig.1.

### 2. Observation

Cloud radars have been employed to participate in various experiments, such as remote sensing observation in WMO Intercomparison of Radiosonde Systems in Yangjiang, China (fig.2), Cloud, Visibility and Weather Phenomena Observation Experiment led by CMA (fig.3), W-band Airborne Radar Flight Experiment (fig.4), as well as numerous daily observation experiments (fig.5). Moreover, cloud radar will take part in the Third Tibet Plateau Observation Experiment. Although the performance of cloud radar as a new remote sensing equipment can be validated by experiment, further research is required to achieve better application and to solve scientific problems.



(a)



(b)



(c)



(d)

Fig.1 Four types of cloud radar

- (a) Ka-band scanning dual polarization radar developed by NRIET Corporation
- (b) W-band airborne radar developed by Anhui Sun Create Corporation
- (c) Ka-band scanning radar developed by Beijing Institute of Radio Measurement
- (d) Ka-band vertical pointing radar developed by Xi'an HuaTeng Microwave Corporation

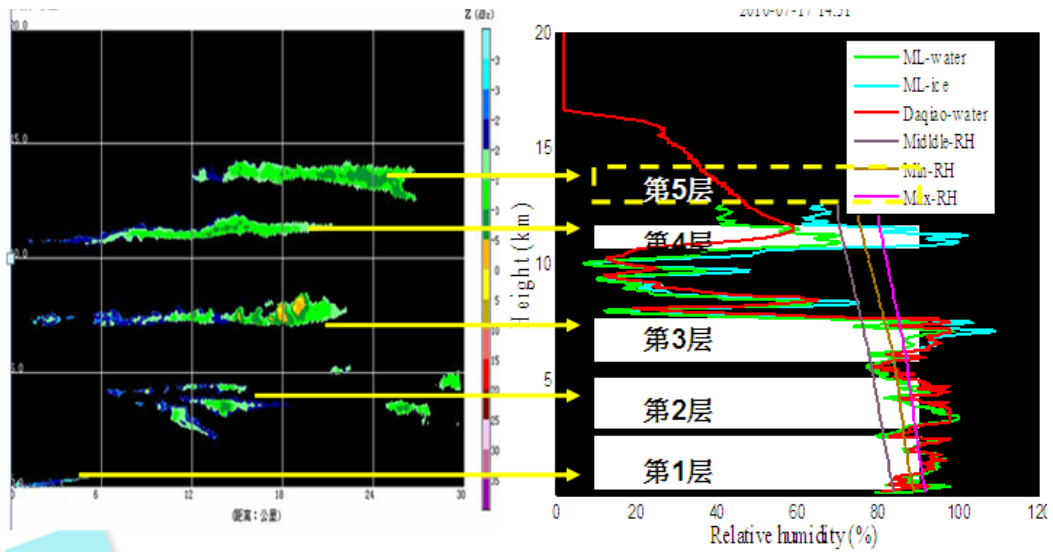


Fig.2 Comparison of cloud radar measurements with radiosonde data in WMO Intercomparison of Radiosonde Systems in Yangjiang, China

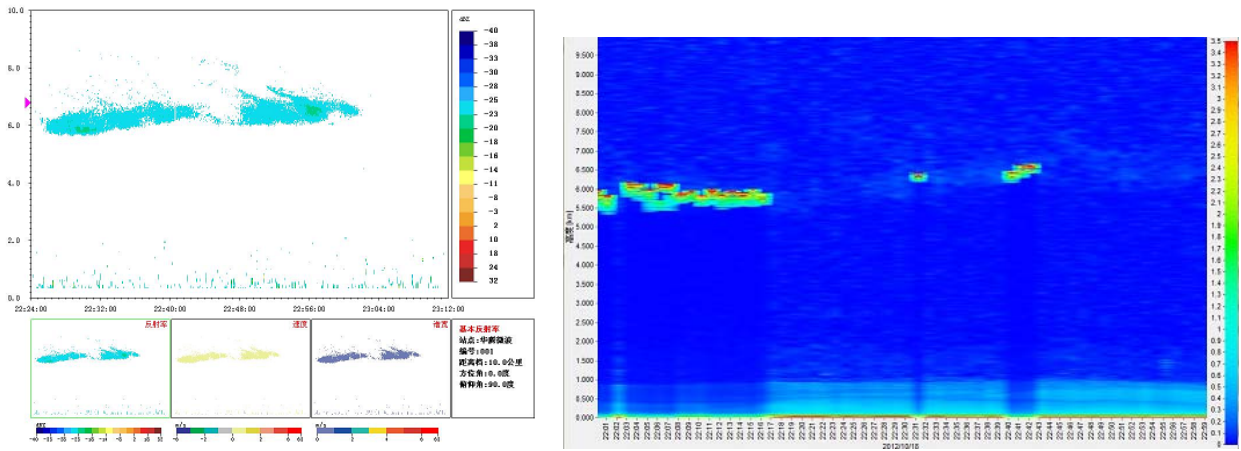


Fig.3 Comparison of cloud radar measurements (left) with laser ceilometer (right) in Cloud, Visibility and Weather Phenomena Observation Experiment

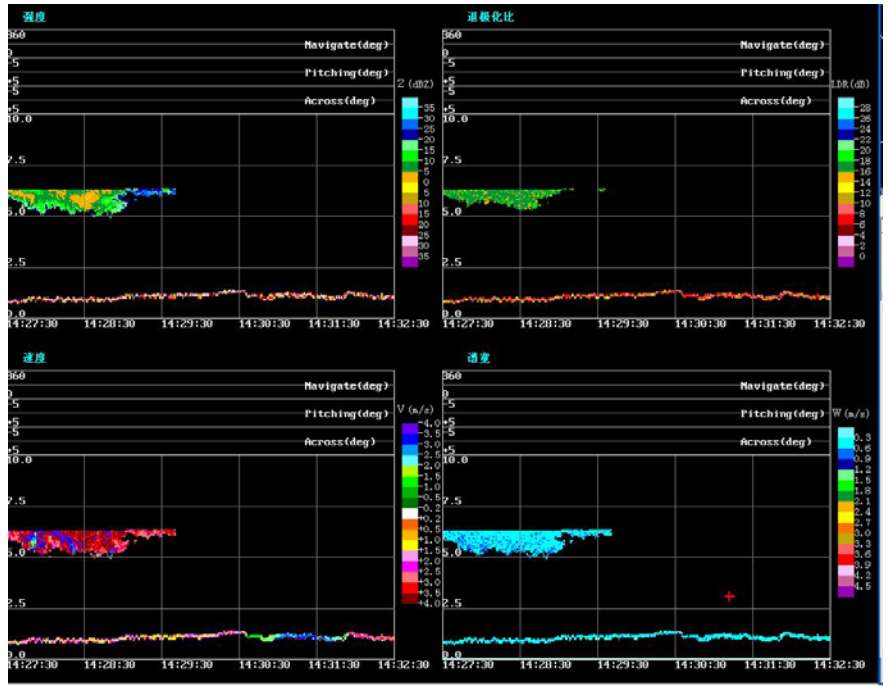


Fig.4 W-band Airborne Cloud Radar Measurements

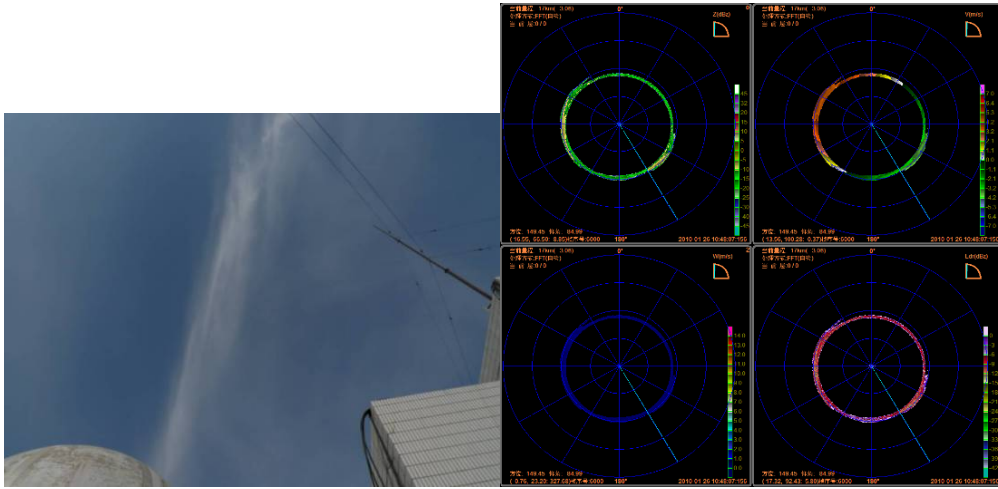


Fig.5 Ka-band radar echo in clear air compared with scene