



# The 2019 WMO-CIMO radiosonde intercomparison campaign, GRUAN's scientific requests

**Ruud Dirksen**

LC

**Giovanni Martucci**

MeteoSwiss Payerne





Compare performance and quality of radiosondes from various manufacturers that are used in the operational network to assess accuracy

## **CIMO report Yangjiang 2010:**

[...] improving the quality and cost-effectiveness of upper air observing systems by providing recommendations on system performances, improvements of instruments and methods of observation, suitable working references to WMO Members and instrument manufacturers.

Involve GRUAN, scientific requests





# Previous campaigns



1984 Bracknell

1985 Wallops

1989 Dzhambul

1993 Tsukuba

1995-1997 Moscow & Wallops

2001 Alcantara

2005 Mauritius

2010 Yangjiang





## Manufacturers

1. Changfeng
2. Daqiao
3. Graw
4. Huayun
5. Intermet
6. Jinyang
7. Lockheed-Martin Sippican
8. Meisei
9. Meteolabor
10. Meteomodem
11. Vaisala

## Research instruments

- Humidity  
CFH, Snowwhite, RD100
- Temperature  
Meisei MTR, LMS Multi-thermistor





# Organisation 2019



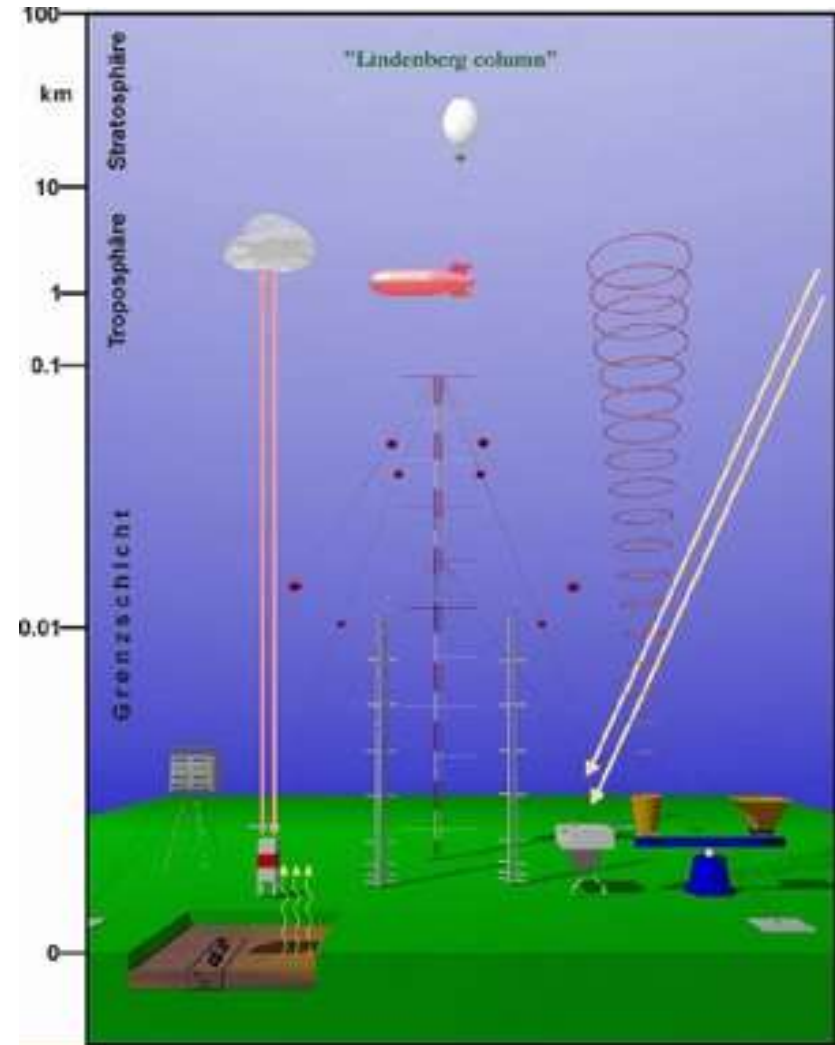
- DWD – MeteoSwiss cooperation
- Location: Lindenberg Observatory
- MeteoSwiss: Personnel (technician, scientist) & financial support
- WMO-CIMO: expert(s) (Tim Oakley?)





## Lindenberg column

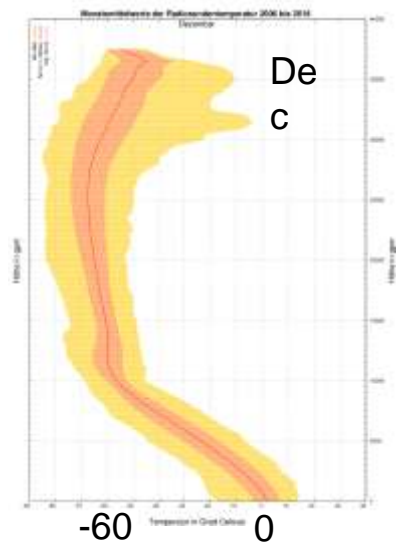
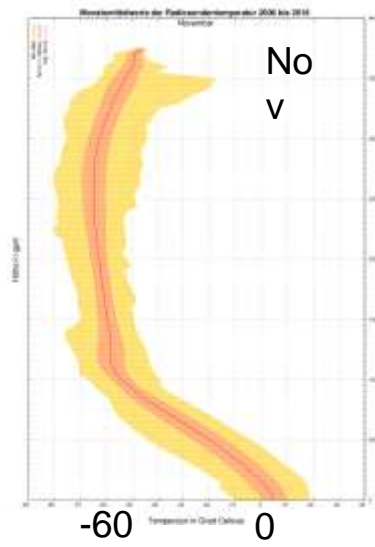
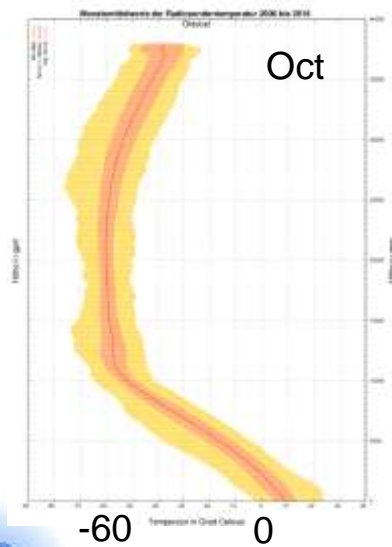
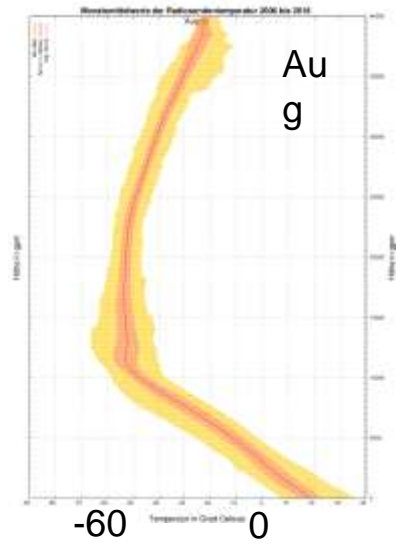
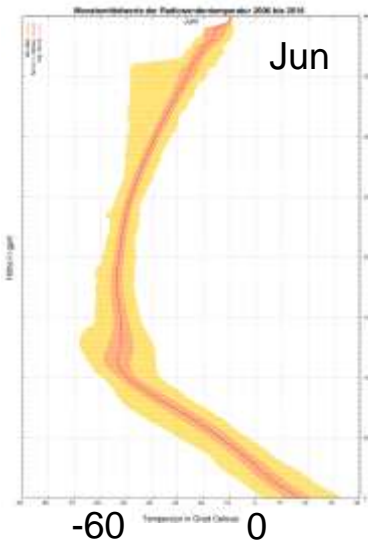
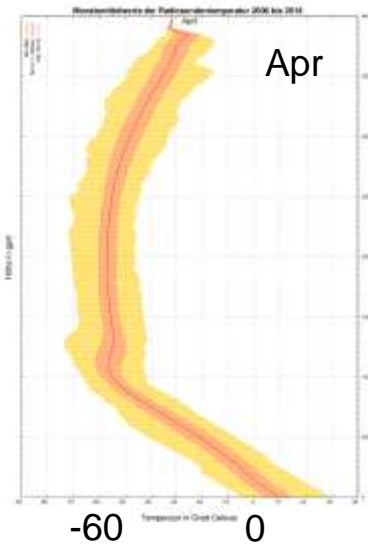
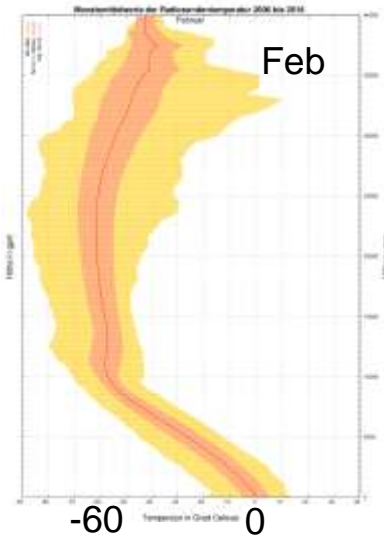
- Microwave radiometer
- Cloudradar
- Sodar
- Raman lidar
- Windprofiler
- Ceilometer
- IR Doppler-lidar
- Radiation (incl. profiles)





# Climatology: temperature 2006-2016

Deutscher Wetterdienst  
Wetter und Klima aus einer Hand

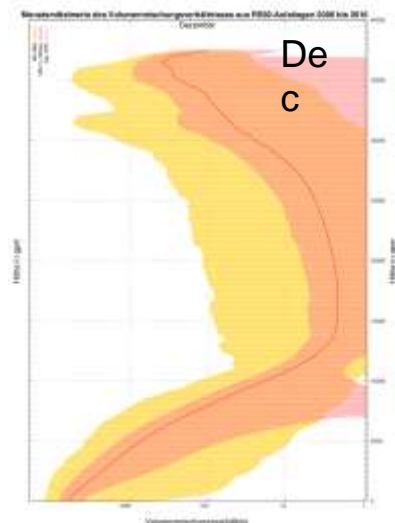
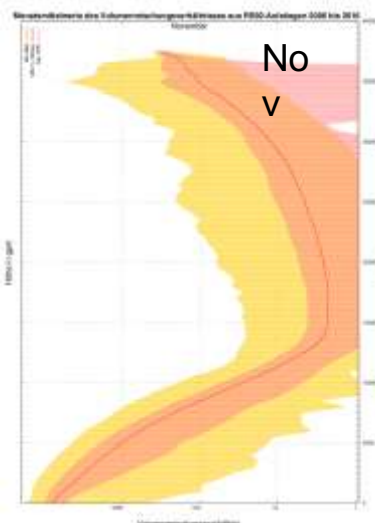
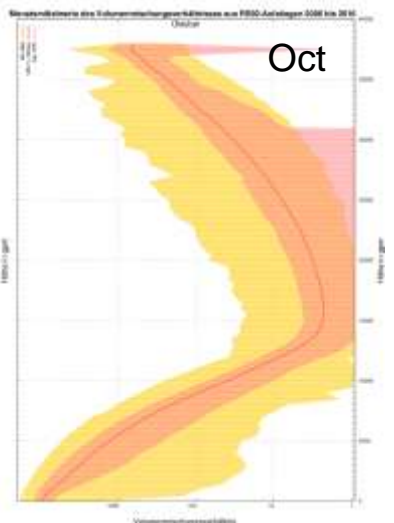
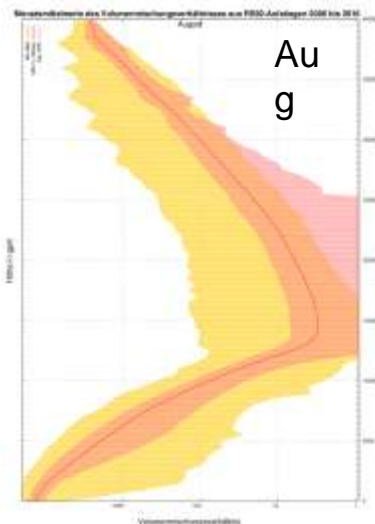
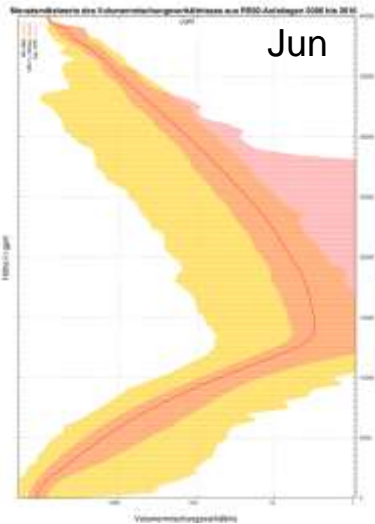
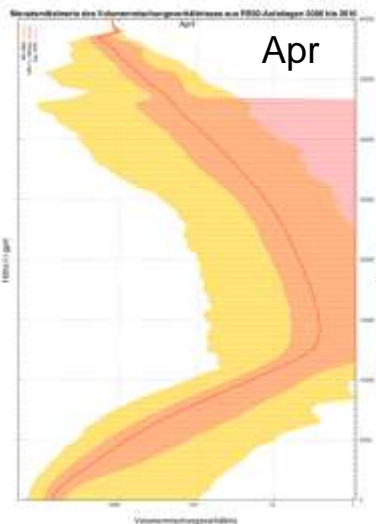
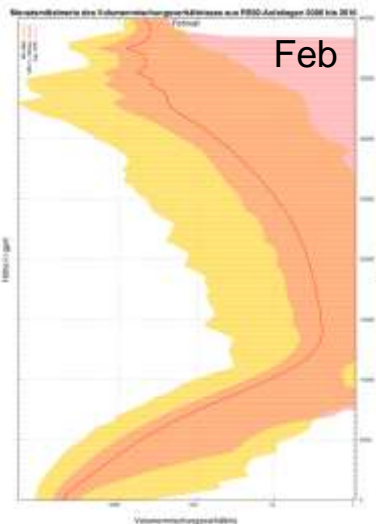






# Climatology: water vapor 2006-2016

Deutscher Wetterdienst  
Wetter und Klima aus einer Hand







## Temperature

- Tropopause  $-50$   $-60^{\circ}$  C
- Stratosphere  $-70^{\circ}$  C (winter)  $-10^{\circ}$  C (summer)
- largest spread above UT during winter

## Humidity

- Moister lower troposphere in summer. No strong seasonal effects in UTLS





- Include manufacturers from Russia, India, Korea
- Which time of year?
  - Temperature conditions should be challenging for RS
- Reference instruments?
  - Humidity: CFH FPH FLASH PCFH
  - Temperature: ?
- Laboratory experiments?
  - SHC
- Nr of soundings – 15/15 (day/night)
- Campaign duration – 4 weeks





- Rig configuration
  - Multiple rigs needed
  - Radiosonde reference (traveling standard)
- Data policy
  - Manufacturer-processed data product, raw data
  - Dataformat (NetCDF)
  - Which parameters (PTU, wind)
  - GRUAN processing (yes)

