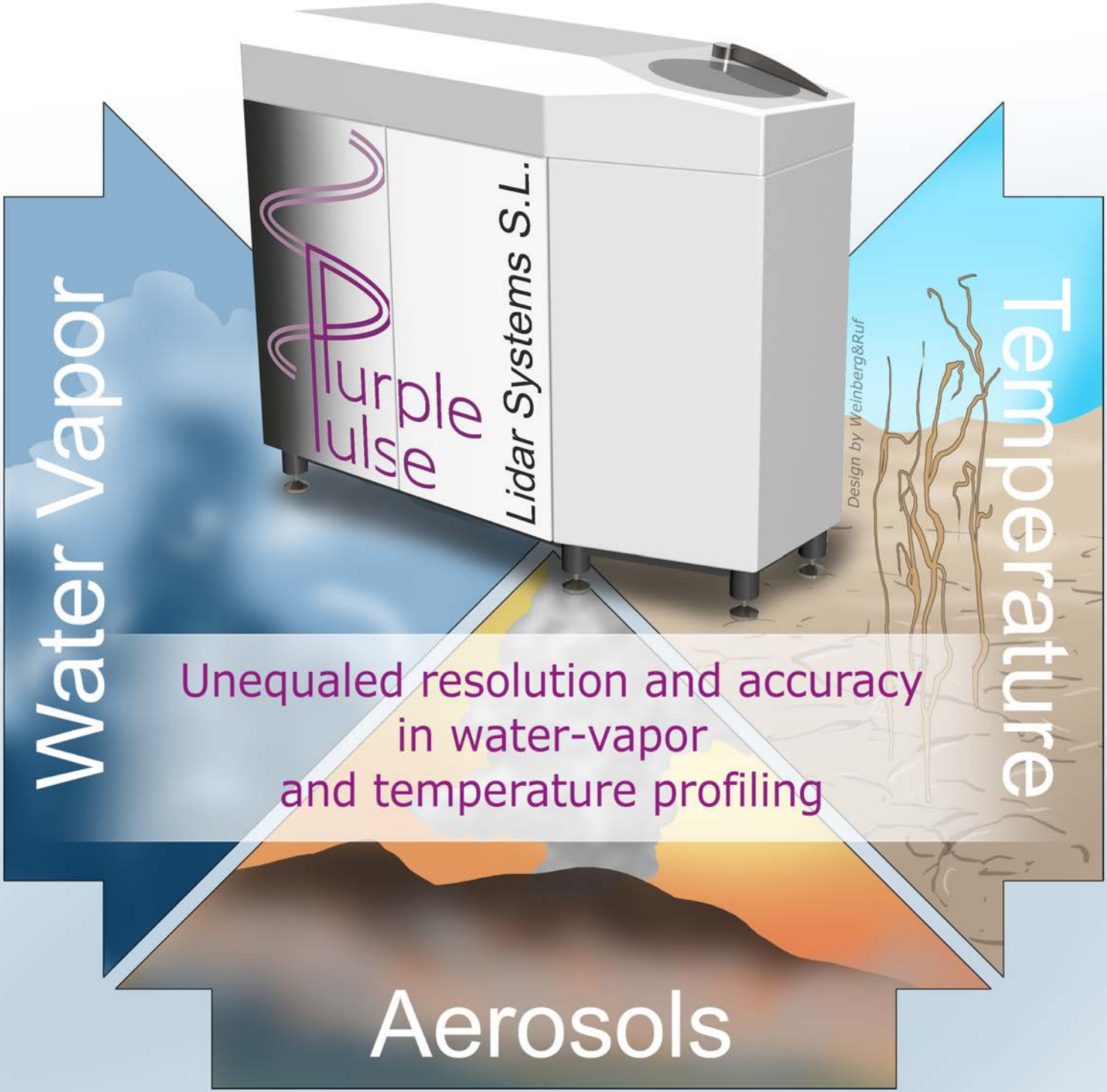
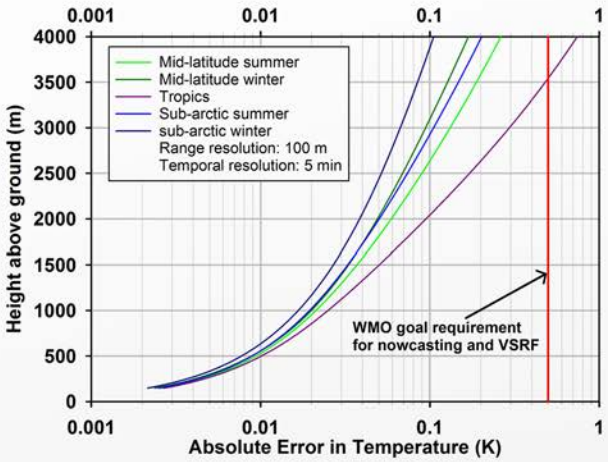

Water Vapor
Temperature
Aerosols
Purple Pulse
Lidar Systems S.L.
Design by Weinberg&Ruf
Unequaled resolution and accuracy
in water-vapor
and temperature profiling

# How does it perform?

The Purple Pulse Lidar System is the first remote sensing instrument fulfilling the WMO breaktrough requirements for water-vapor and temperature measurements throughout the lower troposphere*.

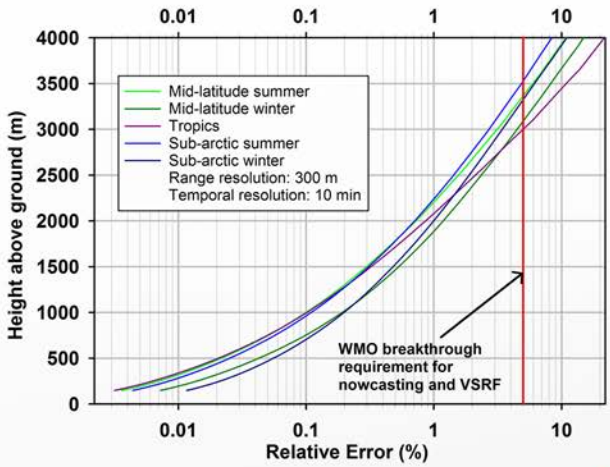
## Properties of daytime temperature measurements:




- Systematic error < 0.5 K
- Statistical error < 0.5 K up to 3.5 km at 5 min, 100 m resolutions exceeding all WMO goal requirements
- 50 m – 300 m vertical resolution
- 10 s – 15 min temporal resolution

* see https://www.wmo-sat.info/oscar/requirements/view/427 and https://www.wmo-sat.info/oscar/requirements/view/704

## Properties of daytime water-vapor mixing-ratio measurements:

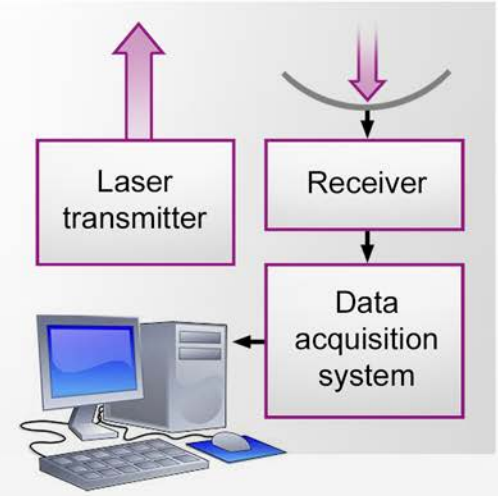



Systematic error < 5 %
Statistical error < 5 % up to 3 km at 10 min, 300 m resolutions exceeding all WMO breakthrough requirements
50 m – 300 m vertical resolution
10 s – 10 min temporal resolution
Fulfills also all WMO goal requirements up to 1.7 km (< 2 % at 5 min, 100 m res.)

## Where can it be applied?

- Data assimilation with short latency
- Severe weather warning
- Process studies and understanding
- Climate monitoring
- Model verification
- Verification of other observing systems

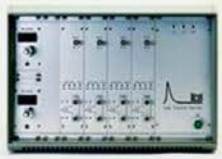
# How does it work?




- Diode-laser-pumped laser transmitter with extraordinary stability, lifetime, and average power

- Extremely stable and efficient receiver featuring most recent advances in filter technology

- Low-noise, high-bandwith data acquisition system



- Real-time water vapor, temperature, aerosol and cloud profiles

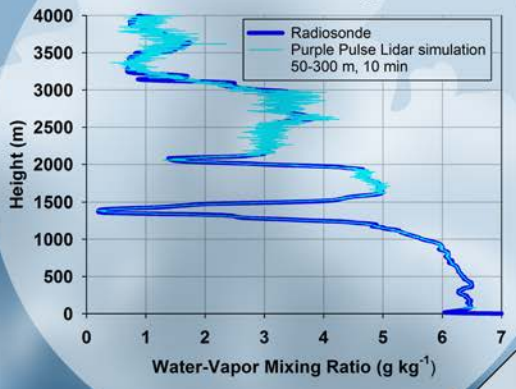
# What makes it unique?

- First comercially available water-vapor and temperature profiler
- Exceptional vertical and temporal resolution at day and night
- Eye safety
- Designed to fulfil most of the WMO requirements for water vapor and temperature profiling
- Resolution of lids and inversions
- Measurement of real atmospheric boundary layer height
- Further variables provided such as relative humidity, potential temperature, and particle extinction coefficient
- Long lifetime of laser transmitter with minor maintenance
- Compact and robust system design
- Vertically pointing (3D scanning capacity upon request)
- Ready for operation in networks

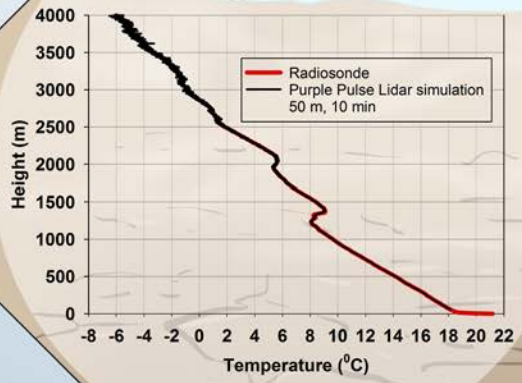
# The Purple Pulse Team

We are a team of atmospheric scientists and engineers
with decades of experiences in
• water-vapor and temperature lidar development
• data assimilation, numerical weather
prediction, and boundary layer research
• receiver and detector design
• diode-laser-pumped
laser technology

## Water Vapor




## Temperature

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References: Wulfmeyer et al., Rev. Geophys. 53, 891-895, 2015, DOI:10.1002/2014RG000476;
Behrendt et al., Atmos. Chem. Phys. 15, 5485-5500, 2015, DOI:10.5194/acp-15-5485-2015.



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