

UHOH Rotational Raman Lidar (RRL)

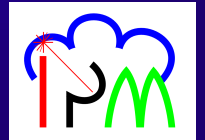


Measured Parameters:

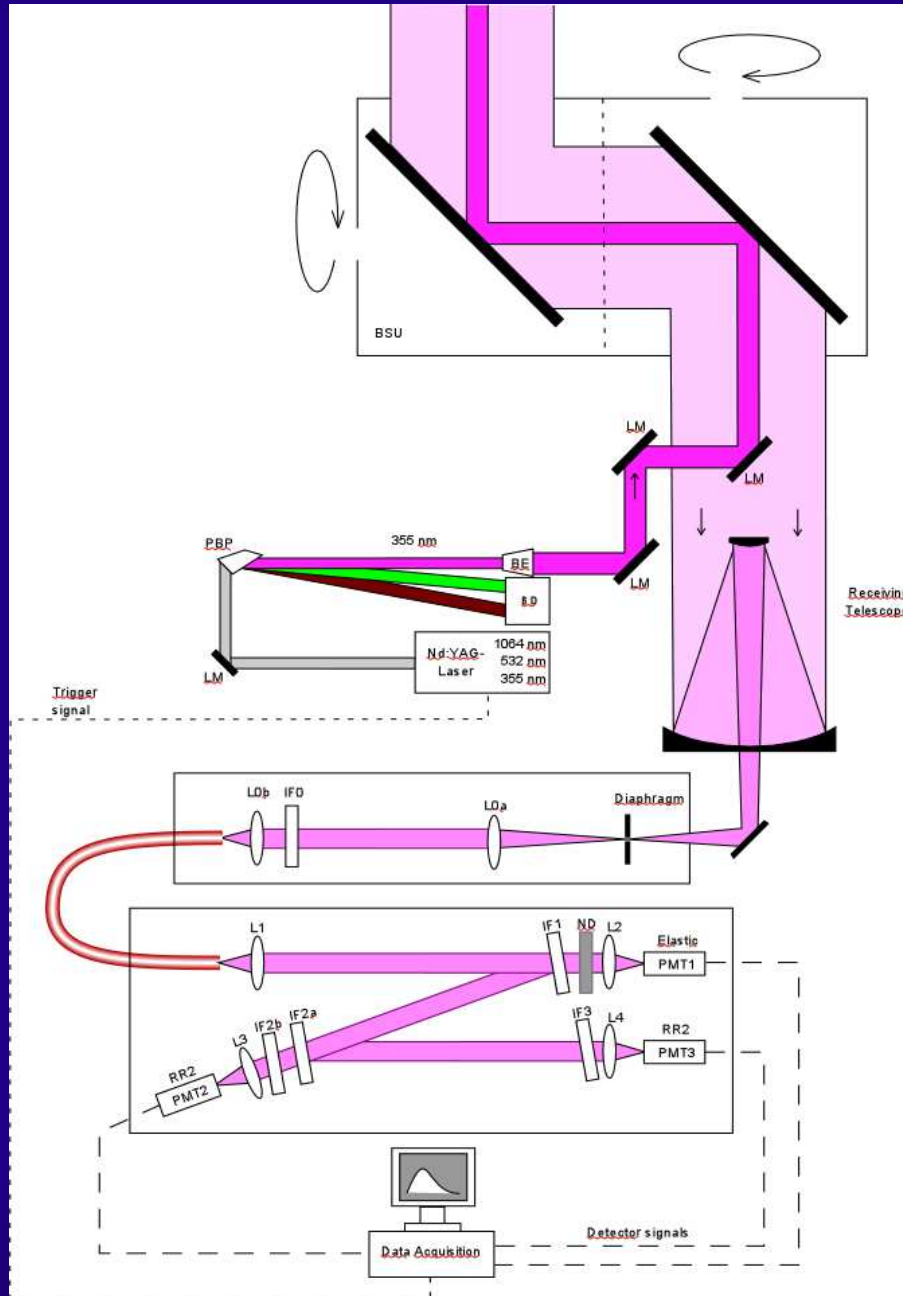
- **Temperature**
- optical aerosols properties
(particle **extinction** coeff.,
particle **backscatter** coeff.)
with measurement uncertainties
without a-priory assumptions
- cloud boundaries, BL height
- wind (via tracking of aerosols or clouds)



Acknowledgements: GKSS, BWplus, NCAR, COSI-TRACKS



UHOH Rotations-Raman-Lidar: Set-up



Transmitter

355 nm

30 Hz, 300 mJ

Eye-safe at $r > 300$ m

Scanner

$\omega_{\max} = 10$ °/s (azimuth)

$\omega_{\max} = 5$ °/s (elevation)

Receiver

40 cm telescope

3 channels

$\Delta r_{\text{raw}} = 3.75$ m; $r_{\text{max}} = 15$ km

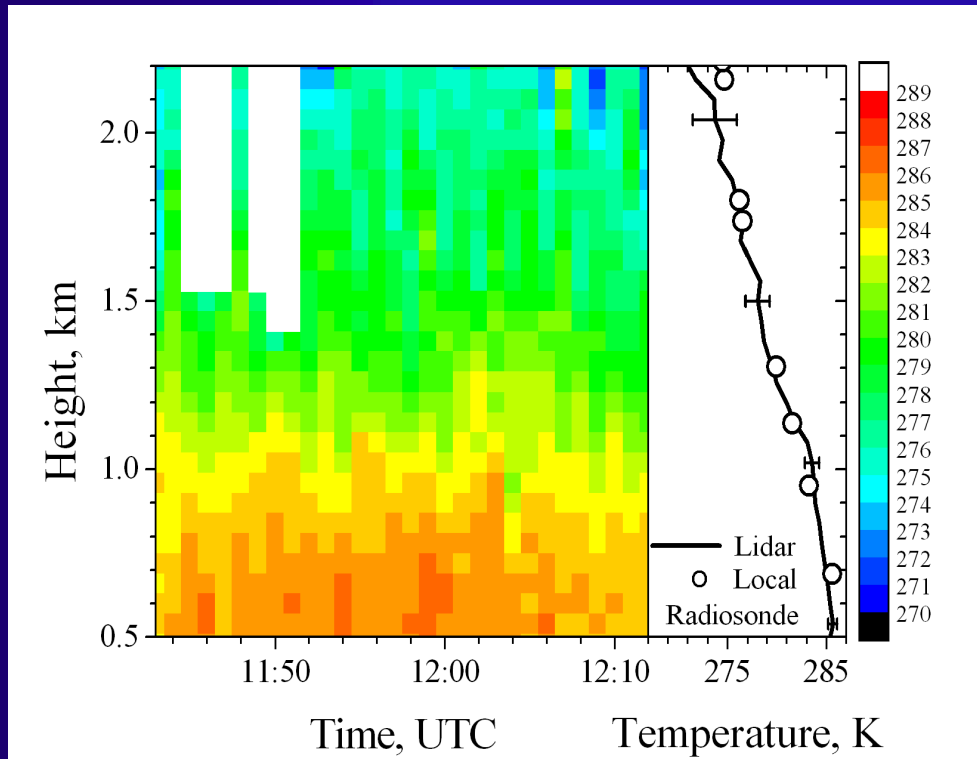
(analog + pc)

$\Delta r_{\text{raw}} = 36$ m; $r_{\text{max}} = 72$ km (pc)

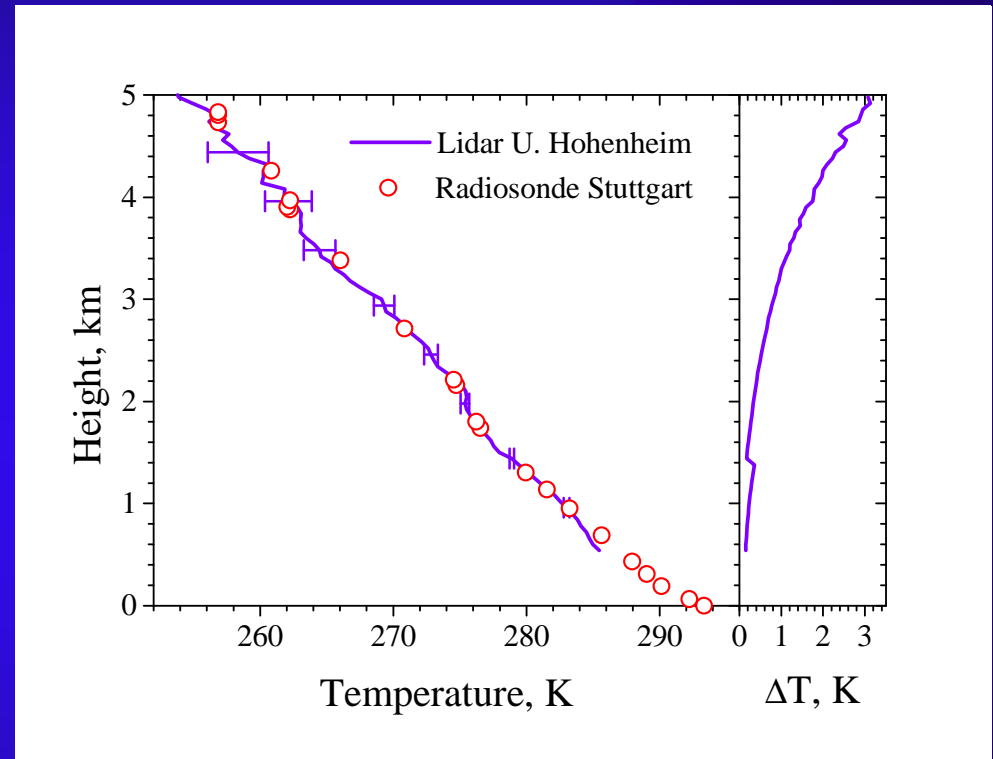
$\Delta t_{\text{raw}} = 30$ Hz

First test measurements were successful!

27 March 2006, vertical, near noon-time

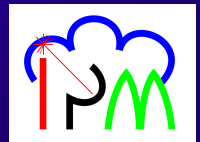


$\Delta t = 60 \text{ s}$, $\Delta z = 240 \text{ m}$



$\Delta t = 20 \text{ minutes}$, $\Delta z = 120, 600 \text{ m}$

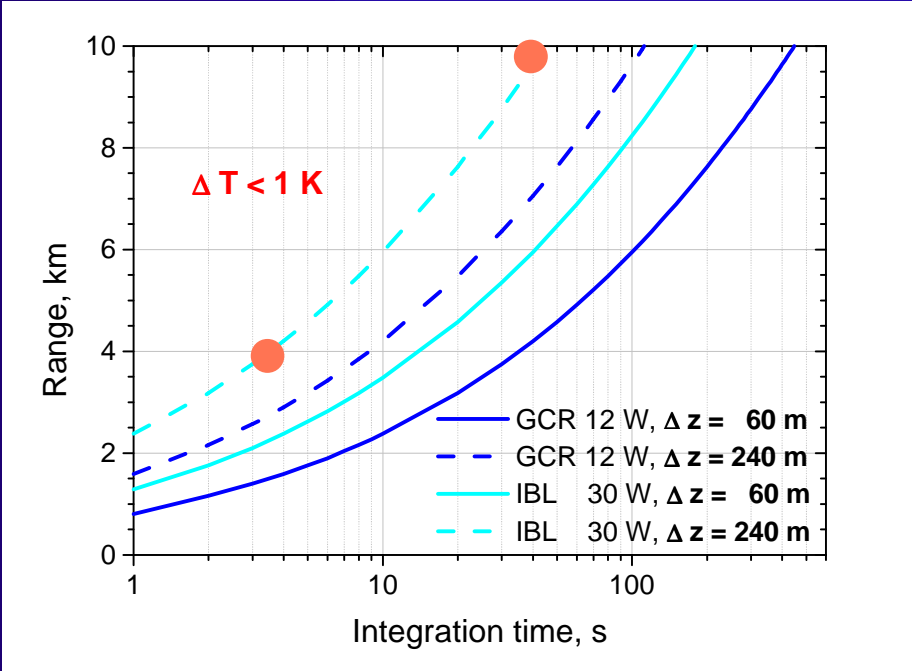
M. Radlach et al, ILRC 2006.



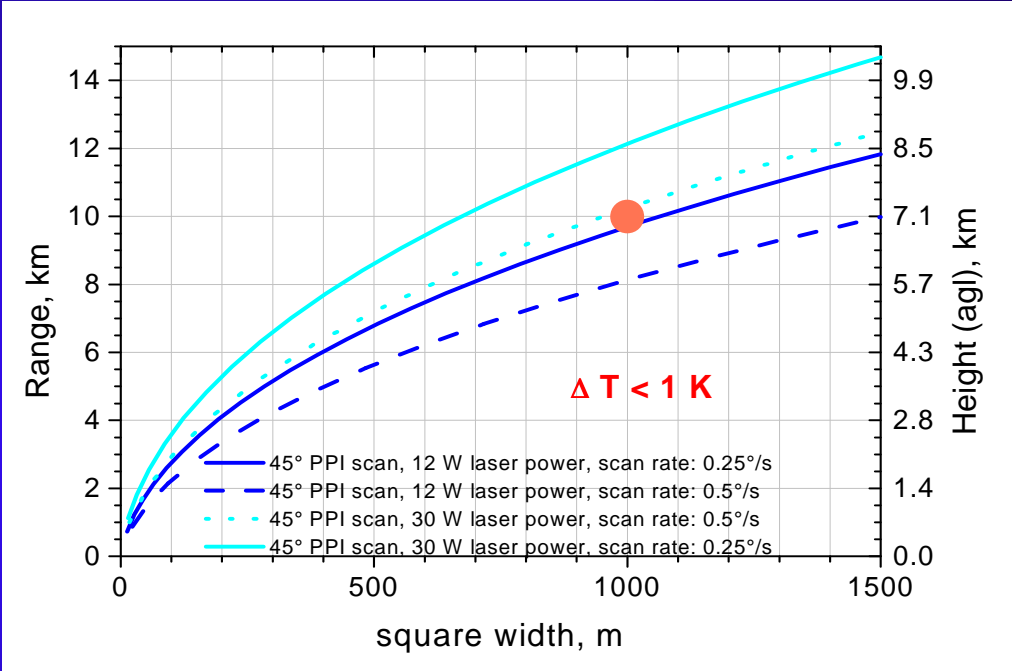
Expected Performance for COPS

(clear sky, no background)

Profiling



PPI scan



$\Delta T < 1$ K, $\Delta z = 0.25$ km,
 → Δt of a few s in the BL + lower trop
 → $\Delta t = 30$ s for $r_{\max} = 10$ km

$\Delta T < 1$ K, 1 km square width
 → $\Delta t = 6$ minutes for $r_{\max} = 10$ km

**First field deployment in July at Hornisgrinde
 within PRINCE.**

