Aerosol and water-vapour profiling with multi-wavelength IPRAL Raman lidar

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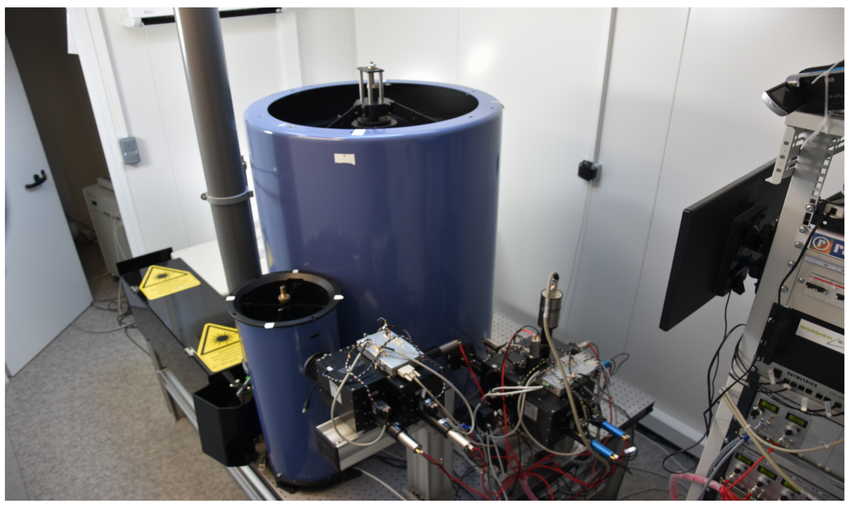
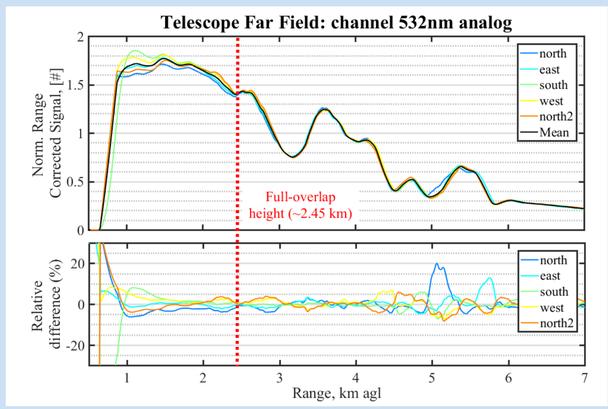
IPRAL System

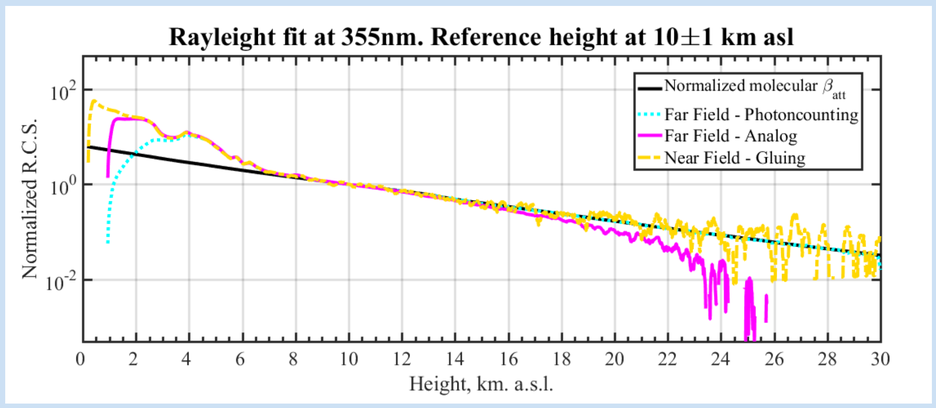


IPRAL Quality Assurance

Telecover check performed on 22/06/2017



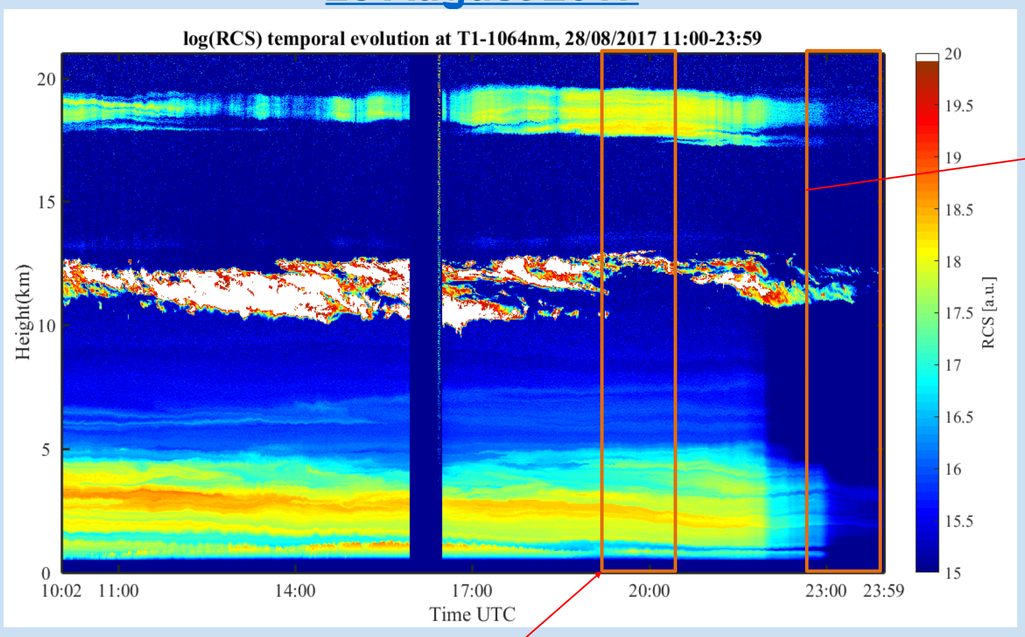
Rayleigh fit

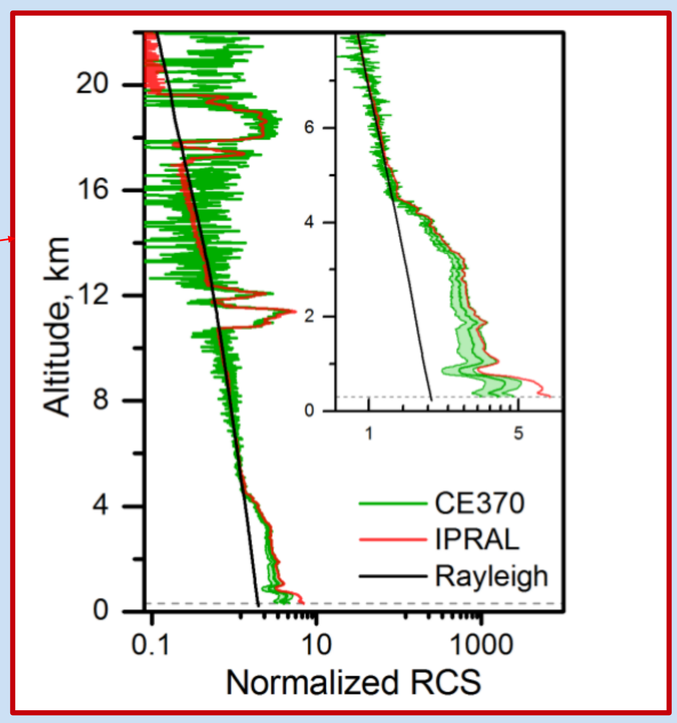


- Far-field telescope 4 quadrant consistency is better than 5% for altitudes greater than 1.5 km.
- Far-field and near-field signals are consistent at altitudes greater than 2 km.
- Far Field analog & photocounting channels follow Rayleigh signal until 15 & 30 km respectively.
- Gluing Near Field analog and photocounting channels is successful following molecular trend until 20 km.

Raman and Klett Inversion

BBA from Canada and Saharian dust 28 August 2017





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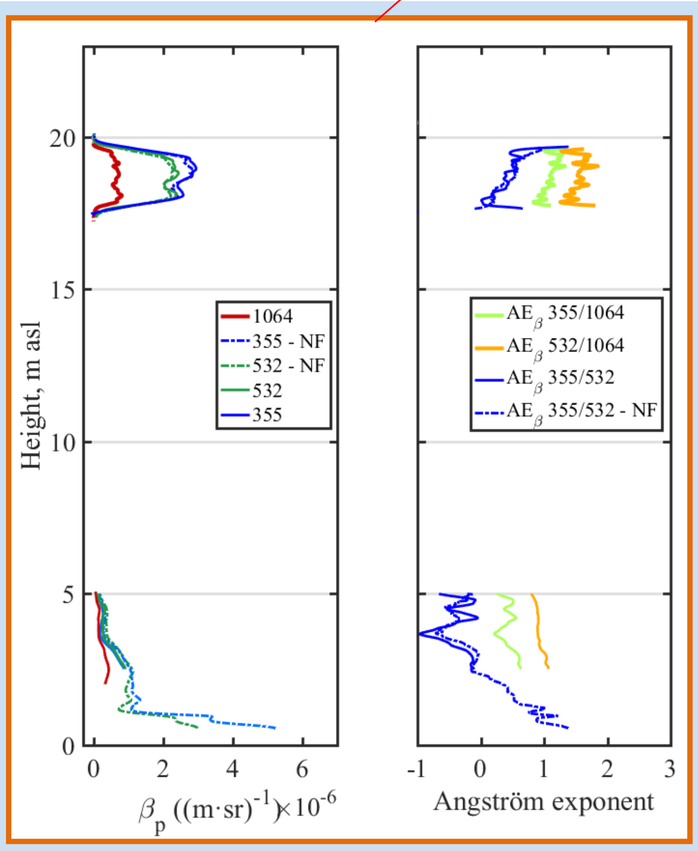
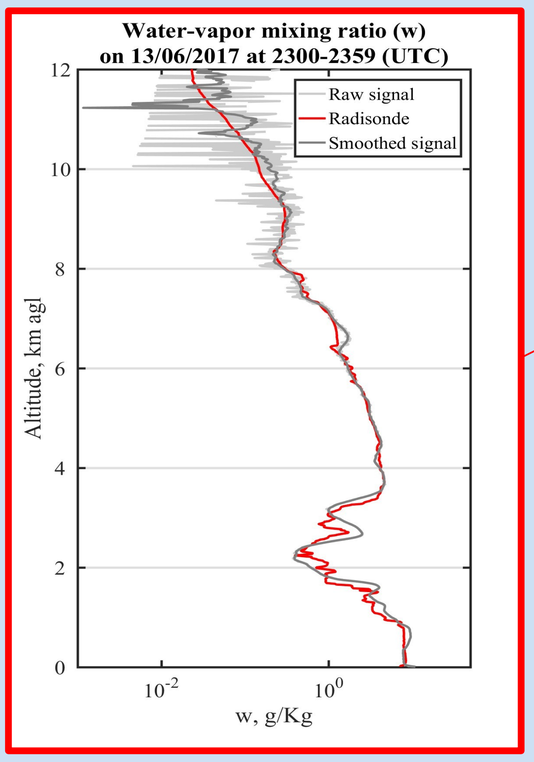
Description and applications of a mobile system performing on-road aerosol remote sensing and in situ measurements
Ioana Elisabeta Popovici et al.

←Normalized range-corrected signals profiles at 532 nm from CIMEL CE370 lidar on-board Lille-LOA mobile platform (green) and IPRAL lidar (red) at Palaiseau, France, on 28 August 2017 (23:15-23:45 UTC).
Displayed from 300 m above (complete overlap altitude of IPRAL system). Rayleigh profile (black line) is calculated from radiosonde measurements at Trappes on 29 August 2017, 00:00 UTC.



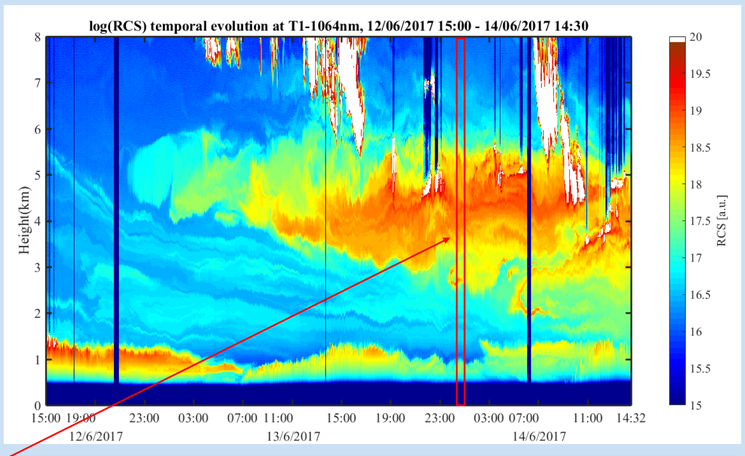
↑Large Angstrom exponent (355-532nm) in the Atmospheric boundary layer (1±0.1) whereas low values detected in the Saharian dust layer (3-5km asl) and in the BBA layer (17.5-20km asl), (-0.3±0.2) and (0.3±0.2), respectively, pointing to a predominance of coarse-mode particle in the lofted layers.
AOD_{BBA} = 0.2, AOD_{DUST} = 0.12, and AOD_{ABL} > 0.11 at 532nm. Considering its altitude, AOD of the BBA layer is extremely high compared to the other layers.

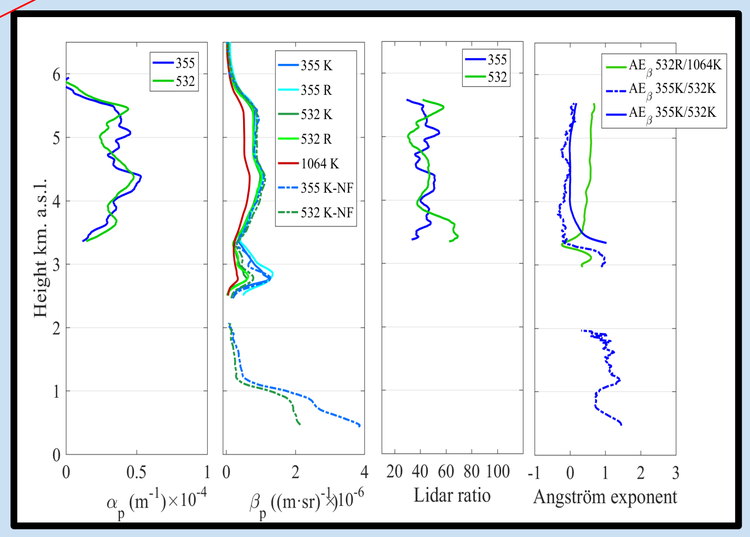
Water vapour mixing ratio



↑Good consistency with radiosonde profiles until 10 km or about 0.1 g/kg

Dust case 12 to 14 June 2017





↑Retrieved intensive aerosol properties (LR~40sr & AE~0) in the lofted layer are in agreement with the literature values of Saharan dust

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