Instrument Inter-Comparison Report

Instrument	
Type	CAPS, 530
Serial Number	21106
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Instrument inter-comparison	
Organization	Leibniz Institute for Tropospheric Research (TROPOS) World Calibration Centre for Aerosol Physics (WCCAP)
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Workshop, etc.	WCCAP-2015-6, 23-28 Nov. 2015

Report	
Status	☐ preliminary ☑ final
Date	

1. Instrument inter-comparison summary

Status on arrival: The instrument get dirty during a dust even Cyprus. The cavity extinction was that high, that the instrument could not be derived any data. The cell was successfully cleaned at the beginning of the workshop.

Noise: The instrumental noise for one minute averages was determined to be 0.17 Mm^{-1}.

Baseline measurement: The baseline extinction was about 0.096±0.031 Mm^{-1}. The deviation from zero is larger than the error of the mean. The deviation is small and not critical.

Comparison to reference CAPS: The instrument showed 5% higher values for extinction compared to the reference CAPS (SN 212009) for Ammonium sulphate and for ambient air.

Comparison to Nephelometer: For non-absorbing particles the extinction is about 5% higher then (truncation corrected) scattering coefficients from a reference Nephelometer (Aurora4000).

Recommendations: Observe total extinction after dust event and clean if necessary.

Overall assessment: The instrument meets the requirements.

2. Technical checks

Table: Baseline check			
Duration	Mean [1/Mm]	standard deviation [1/Mm]	error of the mean [1/Mm]
30 min	0.096	0.17	0.031

3. Comparison to reference CAPS

Inter-comparison to reference CAPS			
Test aerosol	Duration [min]	slope	R^2
Ambient air	753	1.037±0.001	0.98
Ammonium sulphate	348	1.066±0.001	0.999

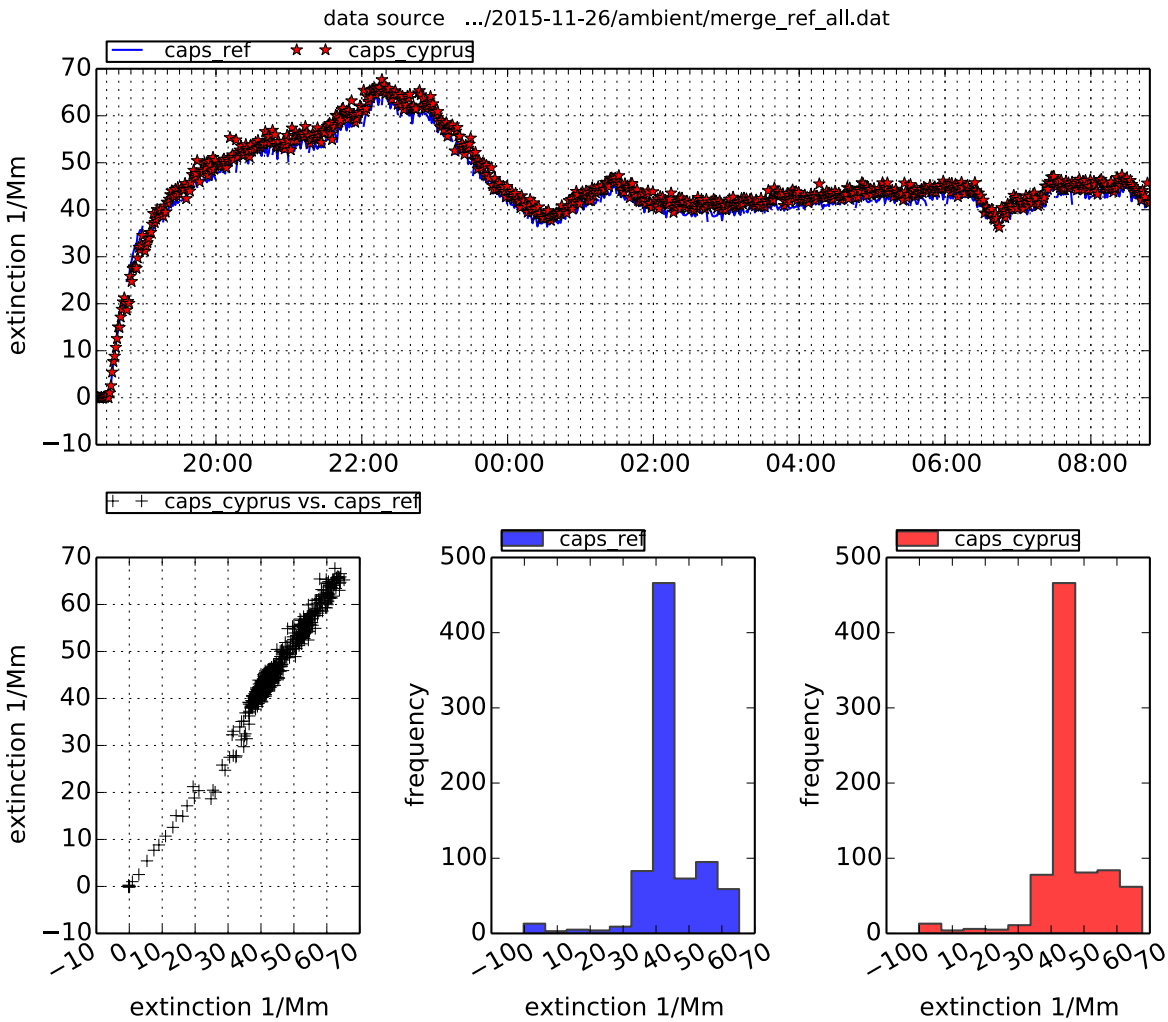

Figure 1: Comparison to reference CAPS using ambient air as test aerosol.

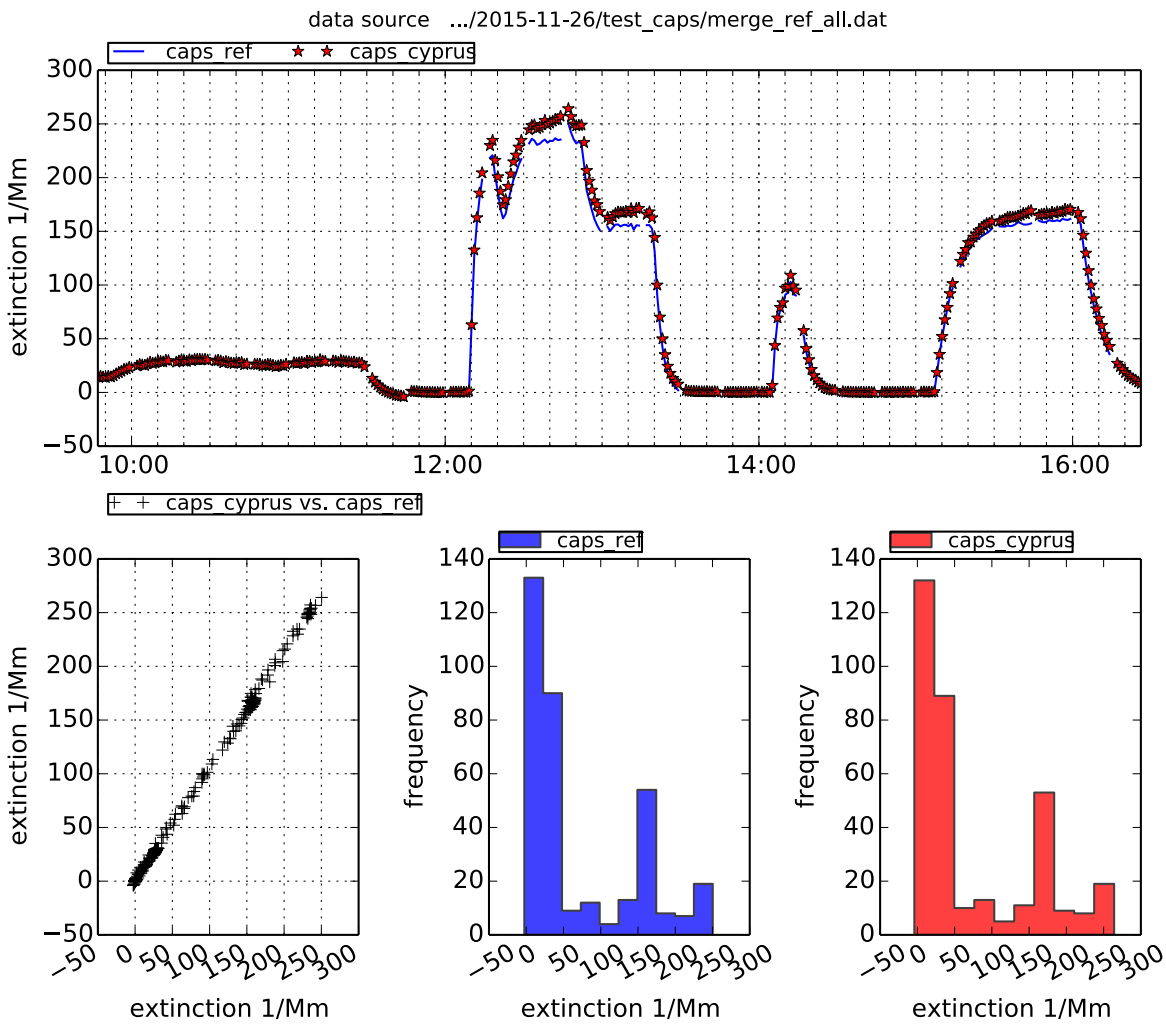

Figure: Comparison to reference CAPS at 530 nm using was ammonium sulphate as test aerosol.

Inter-comparison to scattering measures with the reference Nephelometer[(1)] for non-absorbing particles			
	Duration	slope	R^2
Ammonium sulphate	349	1.049±0.002	0.999

[(1)] Nephelometer values were corrected for truncation and adjusted to 530 nm.

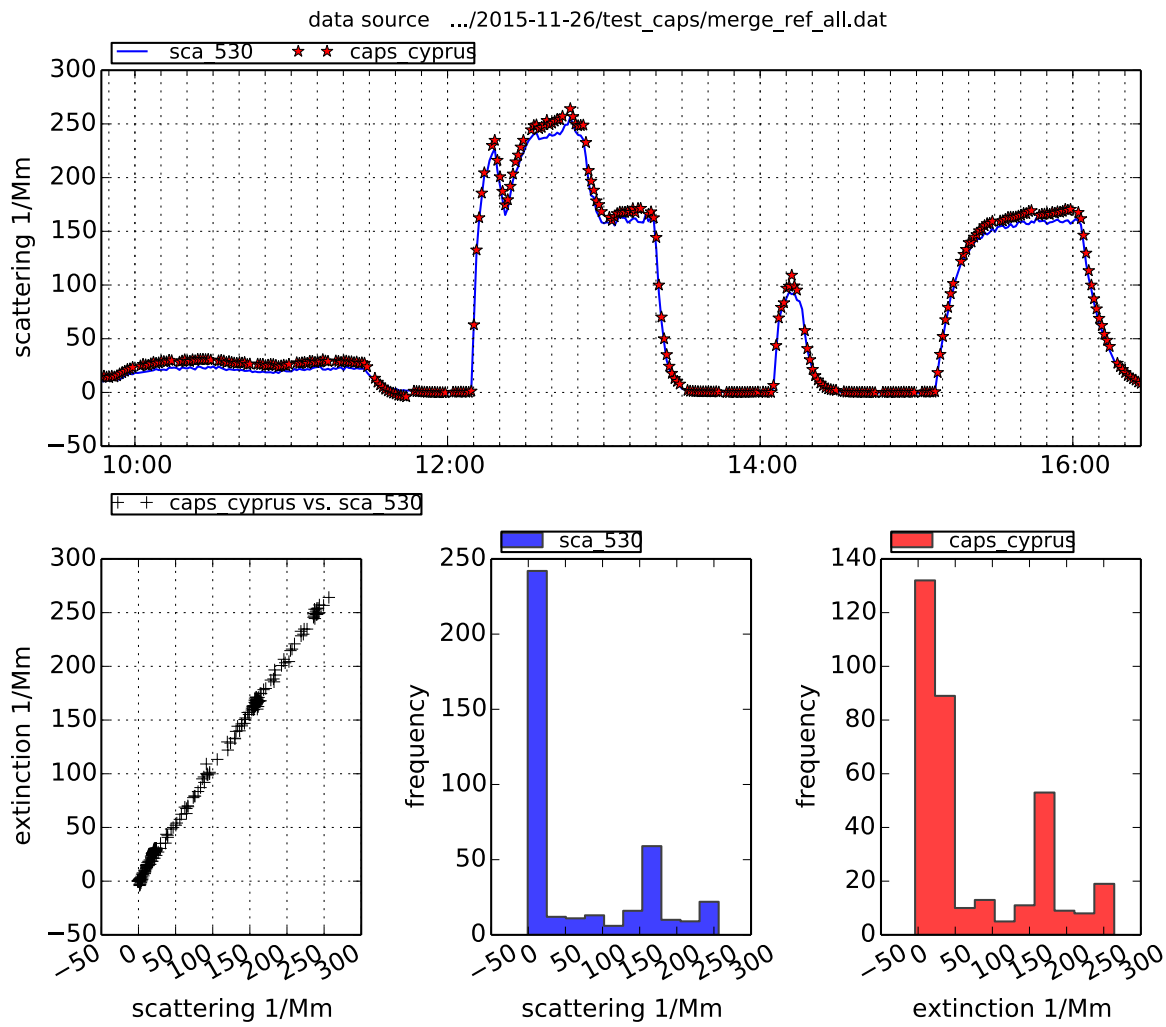

Figure 3: Inter-comparison to scattering from Nephelometer using ammonium sulphate as test aerosol.