

Instrument Inter-Comparison Report

Instrument	
Type	CAPS, 530 nm
Serial Number	211002
Institution	University of Helsinki
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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	<input type="checkbox"/> preliminary <input checked="" type="checkbox"/> final
Date	

1. Instrument inter-comparison summary

Status on arrival: ok

Noise: Then instrument passed the noise and zero check. The noise was determined to be 0.201 Mm^{-1} for one minute averages.

Baseline measurement: The baseline is on average about -0.007 Mm^{-1} with an error of the average of 0.041 Mm^{-1} .

Comparison to reference CAPS: Extinction coefficients are 12% higher than for the reference CAPS (SN212009). For test runs with Ammonium sulphate the values are higher by 16%. The higher values are partly caused by periods with spikes.

Comparison to Nephelometer: For ammonium sulphate the instrument showed 14% higher values compared to a reference Nephelometer (Aurora4000).

Other observation: Sometimes periods with spikes occurred.

Recommendations: Reason for spikes found and eliminated. Even when removing spikes, the values are too high by more than 10%.

Overall assessment: The instrument **does not** meet the requirements?

2. Technical checks

Table: Zero an baseline check

Duration	Mean [1/Mm]	standard deviation [1/Mm]	error of the mean [1/Mm]
30 min	-0.007	0.201	0.041

3. Comparison to reference CAPS

Inter-comparison to reference CAPS

Test aerosol	Duration [min]	slope	R ²
Ambient air	731	1.125±0.002	0.907
Ammonium sulphate	349	1.167±0.004	0.992

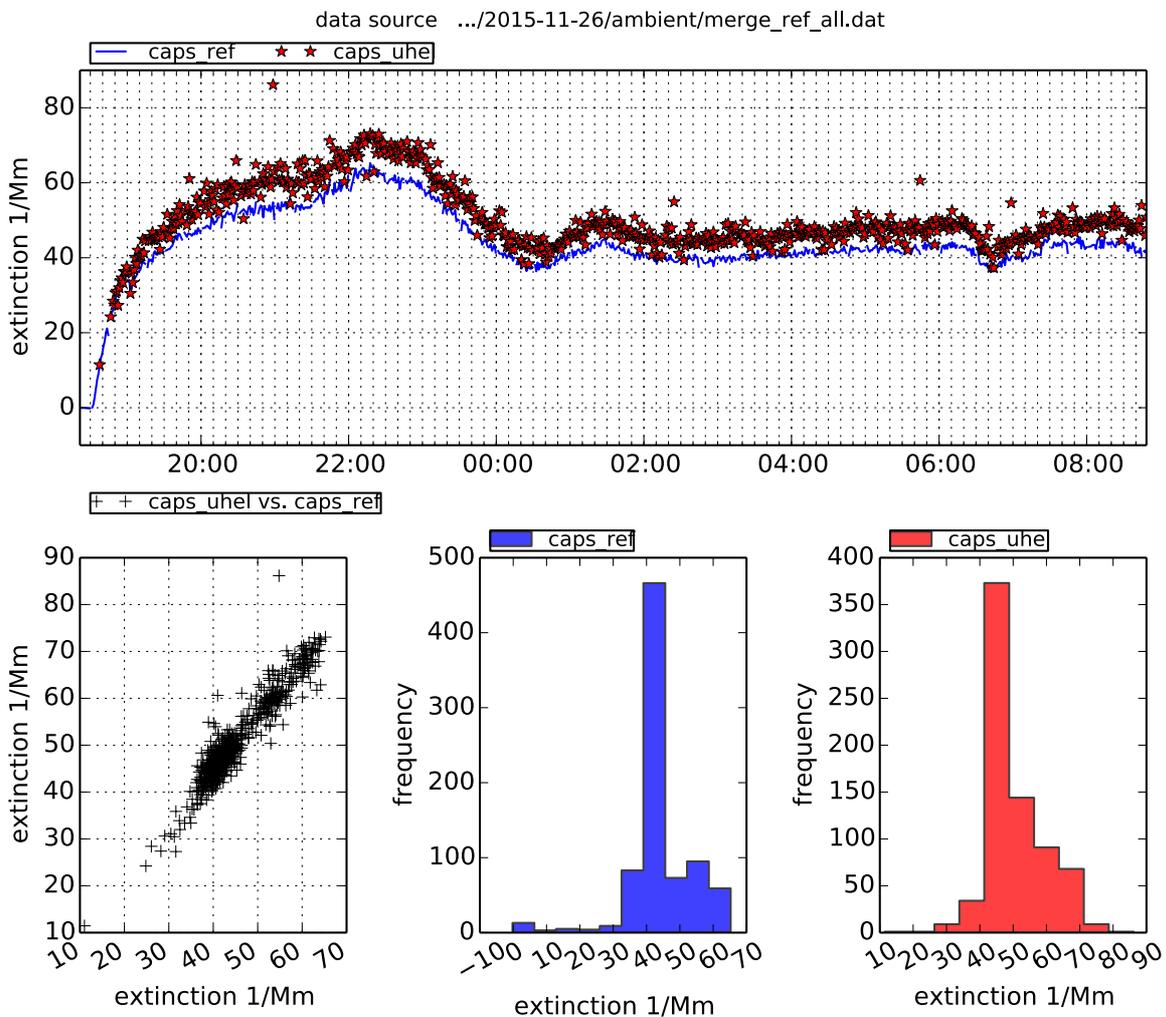


Figure 1: Comparison to reference CAPS. Test aerosol was ambient air.

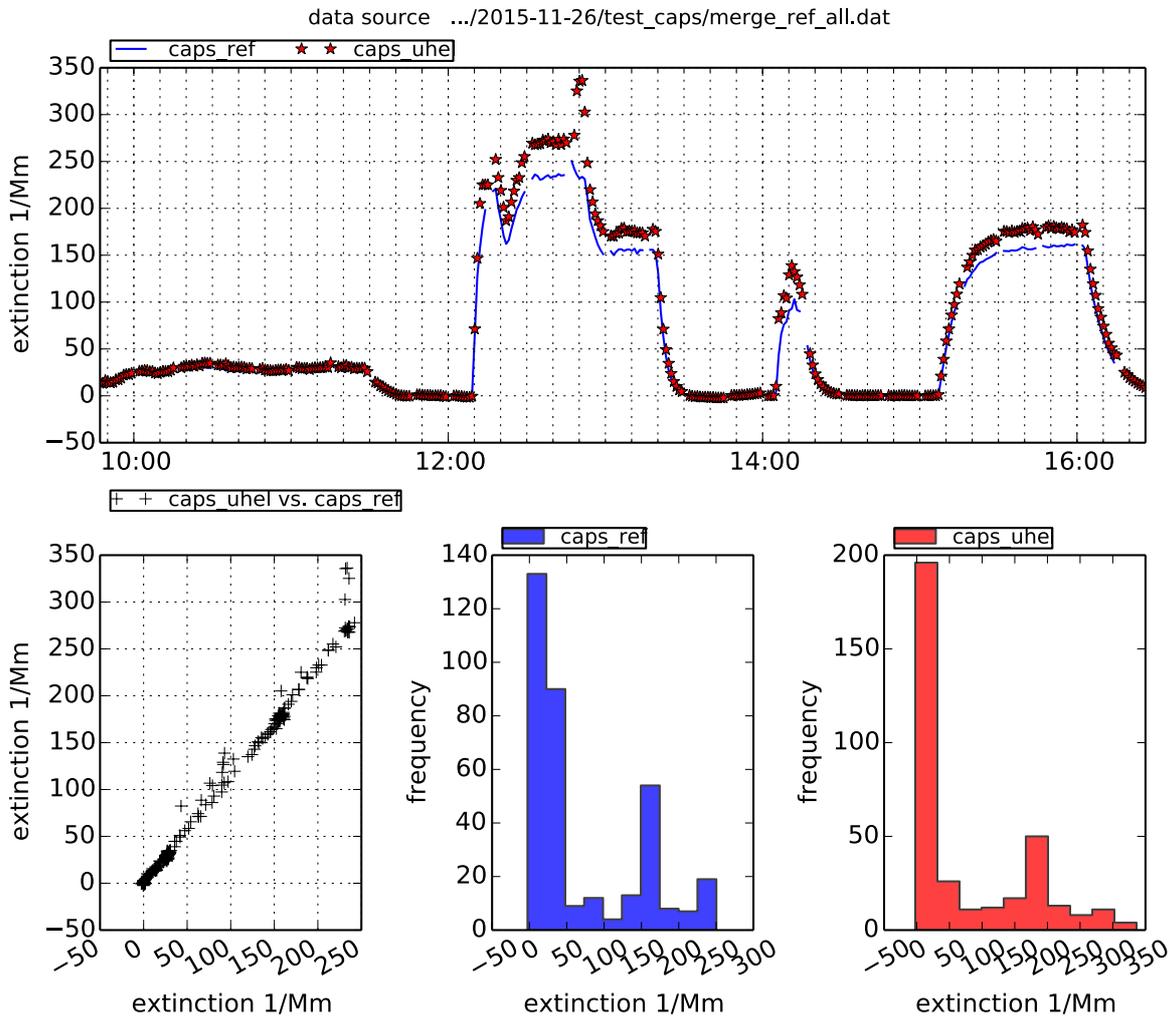


Figure: Comparison to reference CAPS at 530 nm using ammonium sulphate as test aerosol.

Inter-comparison to scattering from the reference Nephelometer ⁽¹⁾ for non-absorbing particles			
	Duration	slope	R ²
Ammonium sulfate	348	1.167±0.004	0.992

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

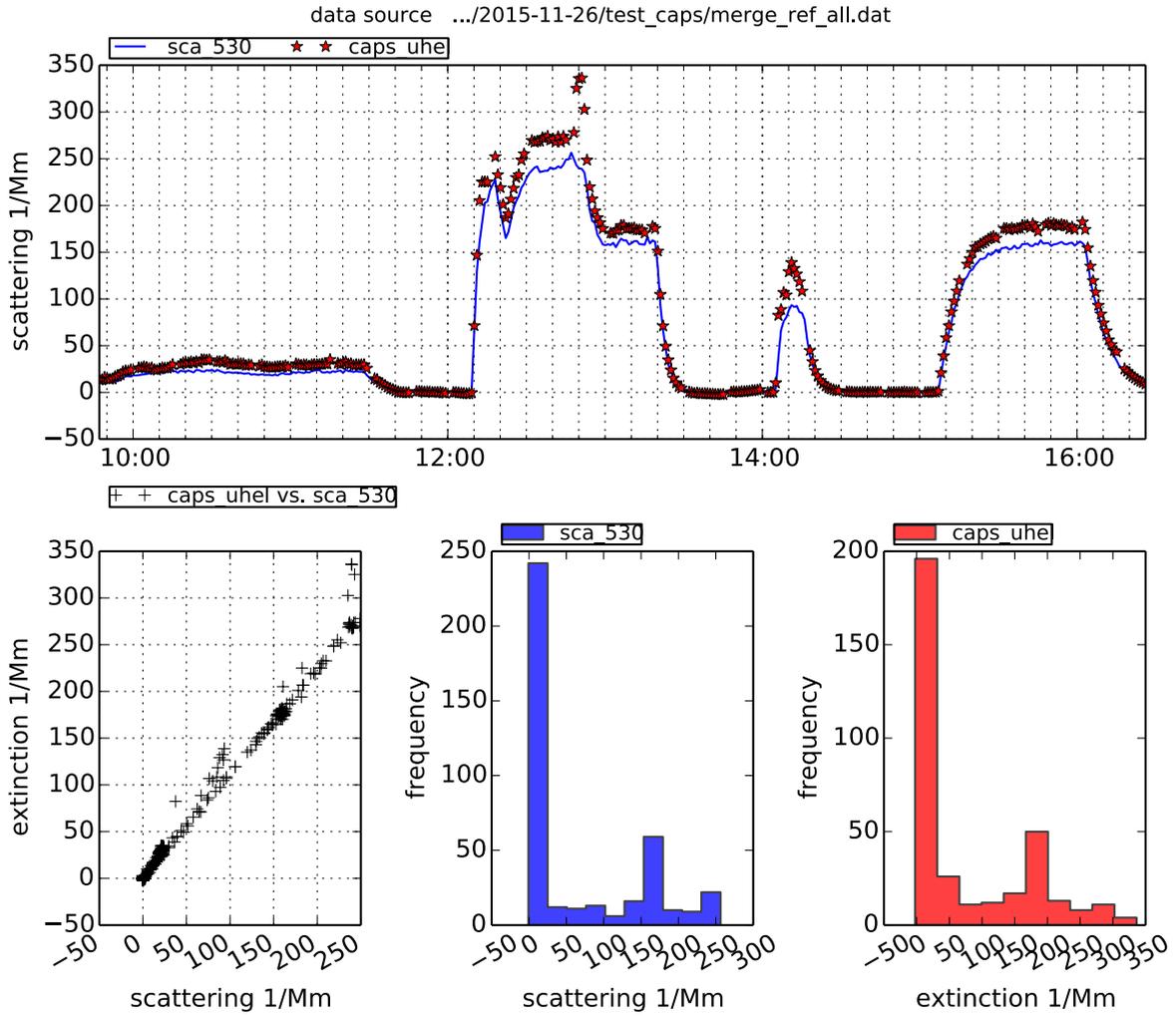


Figure: Inter-comparison to scattering from Nephelometer using ammonium sulphate. Nephelometer data were corrected for scattering.