

Intercomparison of Condensation Particle Counter

Project No.: CPC-2017-1-2

Principal Investigator:

Home Institution:

Participant:

Candidate: **I-Capo Granitola**
Counter (SN): TSI CPC Model 3776; SN: 3776143802

Location of the quality assurance: TROPOS Leipzig, lab 130

Comparison period: January 25, 2017

Last Intercomparison (with Project No.):

TROPOS Reference Instrument: Electrometer: TSI model 3068B
#70838596, Last calibration in April 2016

Additional Equipment: Bubble flow meter 'Giliblator', Gilian (Sensidyne)

Summary of Intercomparison

Pre-Status:

The candidate did not pass the quality standards of ACTRIS and GAW. The candidate reached only 40% efficiency at 40 nm. The Dp50 is at 13 nm. The CPC efficiency curve do not correspond to the standard. During the pre-status the internal flows were out of range. After checking and adjusting the flow, the CPC got better performance but still out of range. TROPOS recommends sending the instrument to TSI for checking.

Final Status:

The candidate did not pass the quality standards of ACTRIS and GAW. The candidate reached 100% efficiency at 40 nm, but the efficiency curve do not correspond to the standard of a 3776. The Dp50 is at 10.7 nm. It is necessary to have it checked by TSI.

Status of the candidate:

<i>CPC status</i>	Pre-Status	Final Status
<i>power/status</i>	LED green	LED green
<i>saturator temp</i>	39 °C	39 °C
<i>condenser temp</i>	10 °C	10 °C
<i>optics temp</i>	40 °C	40 °C
<i>cabinet temp</i>	31.5 °C	31.5 °C
<i>ambient pressure</i>	101.1	101.1
<i>orifice pressure</i>		
<i>nozzle pressure</i>		
<i>laser current</i>	28 mV	27 mV
<i>liquid level</i>	full	full
<i>Aerosol flow (l/min)</i>	0.200 l/min	0.300 l/min

Special Information regarding to the Candidate:

<i>Was it necessary to:</i>	yes/no	information
<i>do a second run</i>	Yes	UCPC is too low at 40 nm
<i>clean the optics</i>	no	
<i>clean the nozzle</i>	Yes	checked
<i>clean the saturator</i>	Yes	checked
<i>change the wick</i>	no	
<i>change the laser</i>	no	
<i>change internal settings</i>	no	

CPC efficiency curve of the candidate: Pre-Status

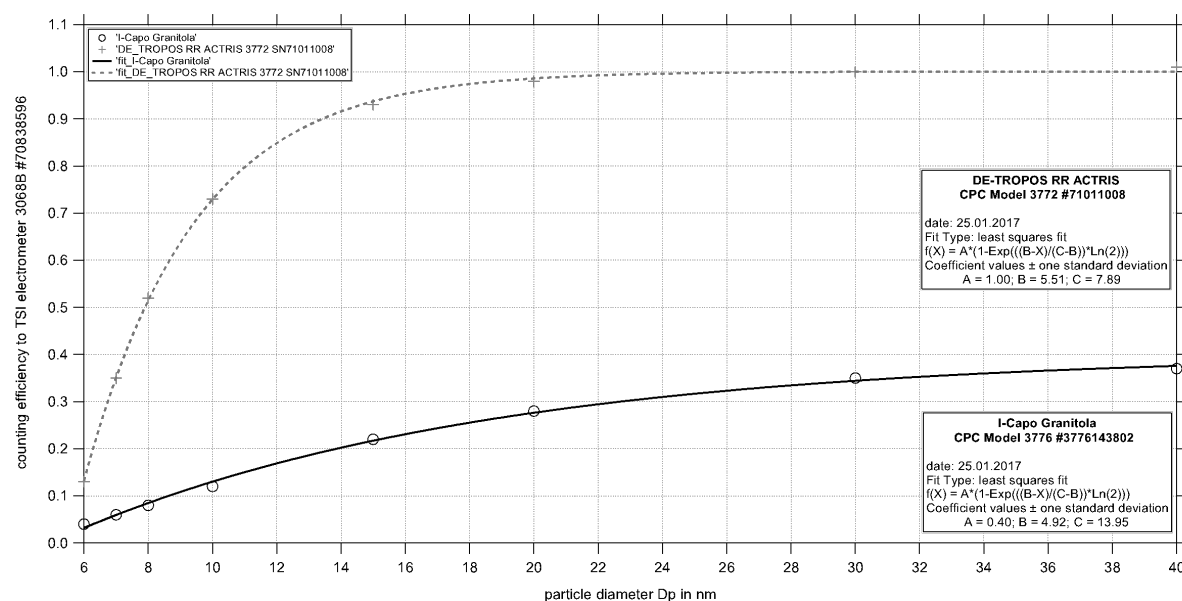


Figure 01: CPC efficiency curve. Based on Electrometer TSI 3068B. Serial number: 70838596

measured data of the candidate: Pre-Status

D_p in nm	counting efficiency
40 nm	0.37
30 nm	0.35
20 nm	0.28
15 nm	0.22
10 nm	0.12
8 nm	0.08
7 nm	0.06
6 nm	0.04

CPC efficiency curve of the candidate: Final-Status

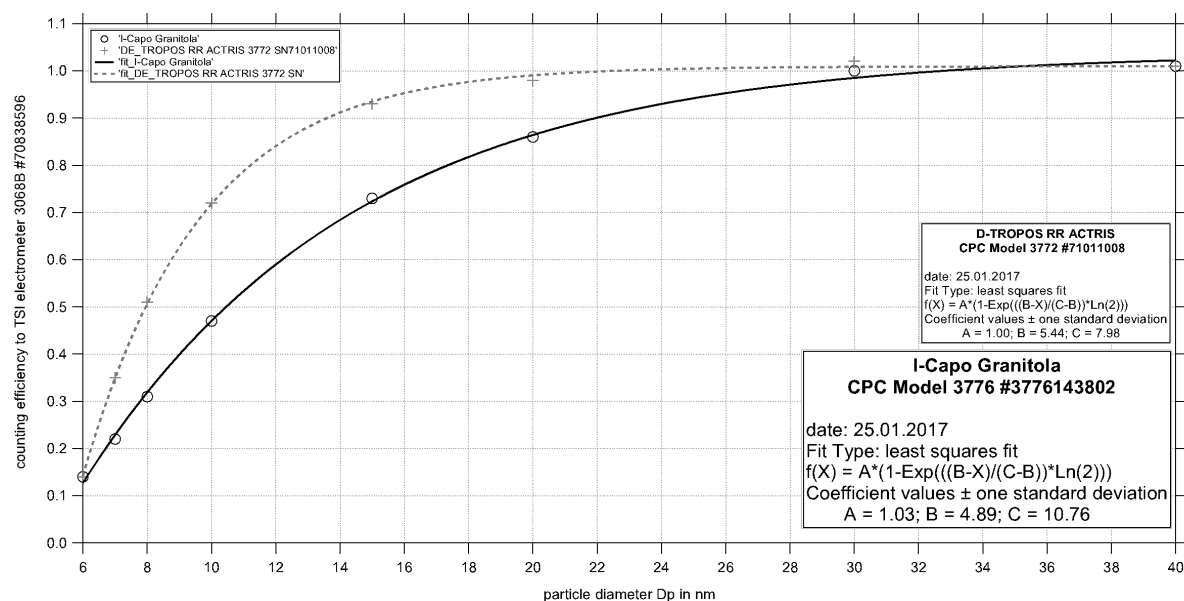


Figure 02: CPC efficiency curve. Based on Electrometer TSI 3068B. Serial number: 70838596

measured data of the candidate: Final-Status

<i>Dp in nm</i>	counting efficiency
<i>40 nm</i>	1.01
<i>30 nm</i>	1.00
<i>20 nm</i>	0.86
<i>15 nm</i>	0.73
<i>10 nm</i>	0.47
<i>9 nm</i>	0.31
<i>8 nm</i>	0.22
<i>7 nm</i>	0.14
<i>6 nm</i>	1.01



Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut



Kalibrierschein

Calibration Certificate

Gegenstand:
Object: Aerosol Elektrometer
ID-Nummer: TSI_3068B_70838596

Hersteller:
Manufacturer: TSI Incorporated

Typ:
Type: 3068B

Kennnummer:
Serial No.: 70838596

Auftraggeber:
Applicant: AG 3.23 - Herr Nowak, Tel.: 3228

Anzahl der Seiten:
Number of pages: 4

Geschäftszeichen:
Reference No.: PTB AG 2.11-1461323527-0327

Kalibrierzeichen:
Calibration mark: 20790 PTB 16

Datum der Kalibrierung:
Date of calibration: 22.04.2016

Im Auftrag:
On behalf of PTB: Braunschweig, 04. Mai. 2016

Im Auftrag:
On behalf of PTB:

Siegel
Seal



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Dr. B. Schumacher

C. Rohrig

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