World Calibration Centre
for Aerosol Physics

TROPOS

Leibniz Institute for
Tropospheric Research

Project No.	CPC-2021-0-24
CPC Model:	TSI CPC 3772
CPC Serial Number:	SN70711210
Customer:	DWD Hohenpeißenberg MPSS CPC
Description:	Calibration of a Condensation Particle Counter
Date of Calibration:	May 18, 2021

Summary of Intercomparison:

The candidate passed the quality standards of ACTRIS and GAW. The Candidate reached 98% efficiency at 40 nm. The Dp50 is at 7.61 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

Certificate / Reference: WCCAP

Date of issue:	May 18, 2021	Signature	
Reviewed by:	TROPOS	Name:	Dipl.-Met. Kay Weinhold

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Table 1. Diagnostic information of candidate

	Unit	Status
Participant		DWD Hohenpeißenberg MPSS SN70711210
CPC Model		3772
Firmware		2.16
Manufacture date		March 2007
Last service date		2020
Arrival date		2021-05-17
Software Version		
Saturator Temperature	°C	39
Condenser Temperature	°C	22
Optics Temperature	°C	40
Cabinet Temperature	°C	31.4
Ambient Pressure	mbar	98.7
Vaccuum Pressure	kPa	
Inlet Pressure	kPa	
Critical Orifice Pressure	kPa	69.9
Aerosol Nozzle Pressure	kPa	2.7
Laser Current	mA	54
Liquid Level		full
Aerosol Flow	L/min	0.999
Zero	avg 10 min	0
Physical inspection		okay
Functional test		running

Table 2. Calibration and laboratory conditions

	Information
Aerosol electrometer	TSI Electrometer Model 3068, SN 70838596
Particles and gases used for calibration	silver particles and nitrogen
Method of particle generation	tube furnace generator
Electrometer calibration certificate	March 08, 2021, calibrated at PTB Braunschweig
Corrections of electrometer (i.e. differing flow rate)	Within tolerance range (+/-2%); reference: 4.0 l/min, measured: 4.0 l/min
Logging software	LabView 2010; National Instruments; Program „LabCount.vi“
Uncertainty in measured flow rate	3%
Flowmeter used	Gilian Gilibrator V; SN 1711008-S, January, 2020
Lab Tempreature and Pressure	23.0°C, 1010 mbar

Table 3. Efficiency of candidate CPC per diameter against the Electrometer

		Pulse Output	
Diameter	EL 3068B (#/cm³)	Concentration (#/cm³)	Efficiency (µ)
40nm_2	1402	1377	0.98
40nm_1	1257	1234	0.98
30nm	1288	1268	0.98
20nm	1336	1314	0.98
15nm	1269	1189	0.94
13nm	1630	1453	0.89
11nm	1708	1387	0.81
10nm	1366	1030	0.75
9nm	1182	799	0.68
8nm	1567	878	0.56
7nm	1399	536	0.38
6nm	1622	225	0.14
5nm	1288	1	0.00

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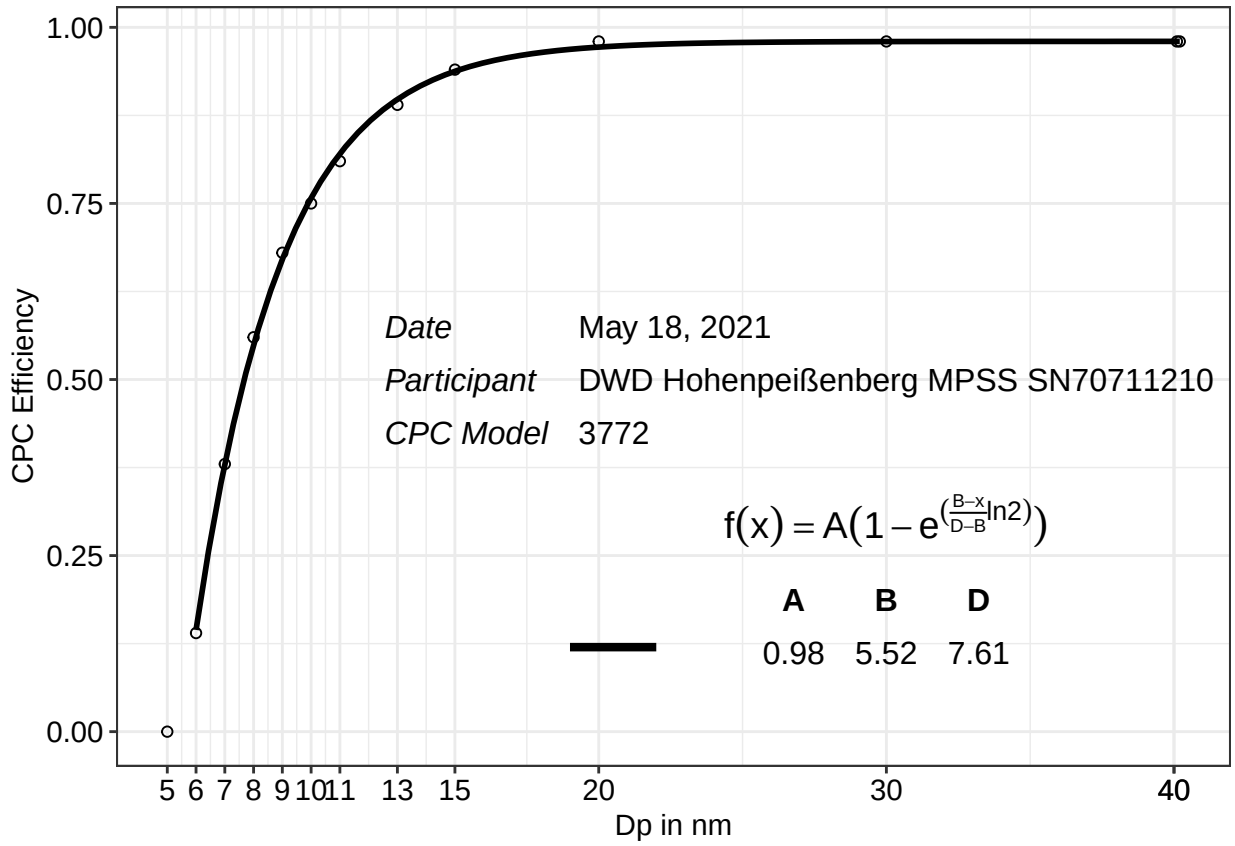

Fig. 1. Counting efficiency of candidate CPC against aerosol electrometer 3068 SN 70838596; silver particles between 5 nm and 40 nm were used for calibration.

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Reference:	TSI electrometer, model 3068, SN 70838596
Reviewed:	TROPOS/Kay Weinhold

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