Leibniz-Institut für Troposphärenforschung Permoserstraße 15 04318 Leipzig

Intercomparison of Condensation Particle Counter

Project No.:	*CPC-2019-5-6*
Principal Investigator:	Christian Maier
Home Institution:	ZAMG, Austria
Participant:	Christian Maier and Gerhard Schauer
Candidate:	SBO UCPC
Counter (SN):	TSI CPC Model 3775 #3775155101
Location of the quality assurance:	TROPOS Leipzig, lab 130
Comparison period:	October 08, 2019
Last Intercomparison (with Project No.):	
TROPOS Reference Instrument:	Electrometer: TSI model 3068B #70838596, Last calibration in September 2018
Additional Equipment:	Bubble flow meter 'Gilibrator', Gilian (Sensidyne) #1711008-S, Last calibration in January 2018

Summary of Intercomparison

Status:
The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 98% efficiency at 40 nm. The Dp50 is at 3.73 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

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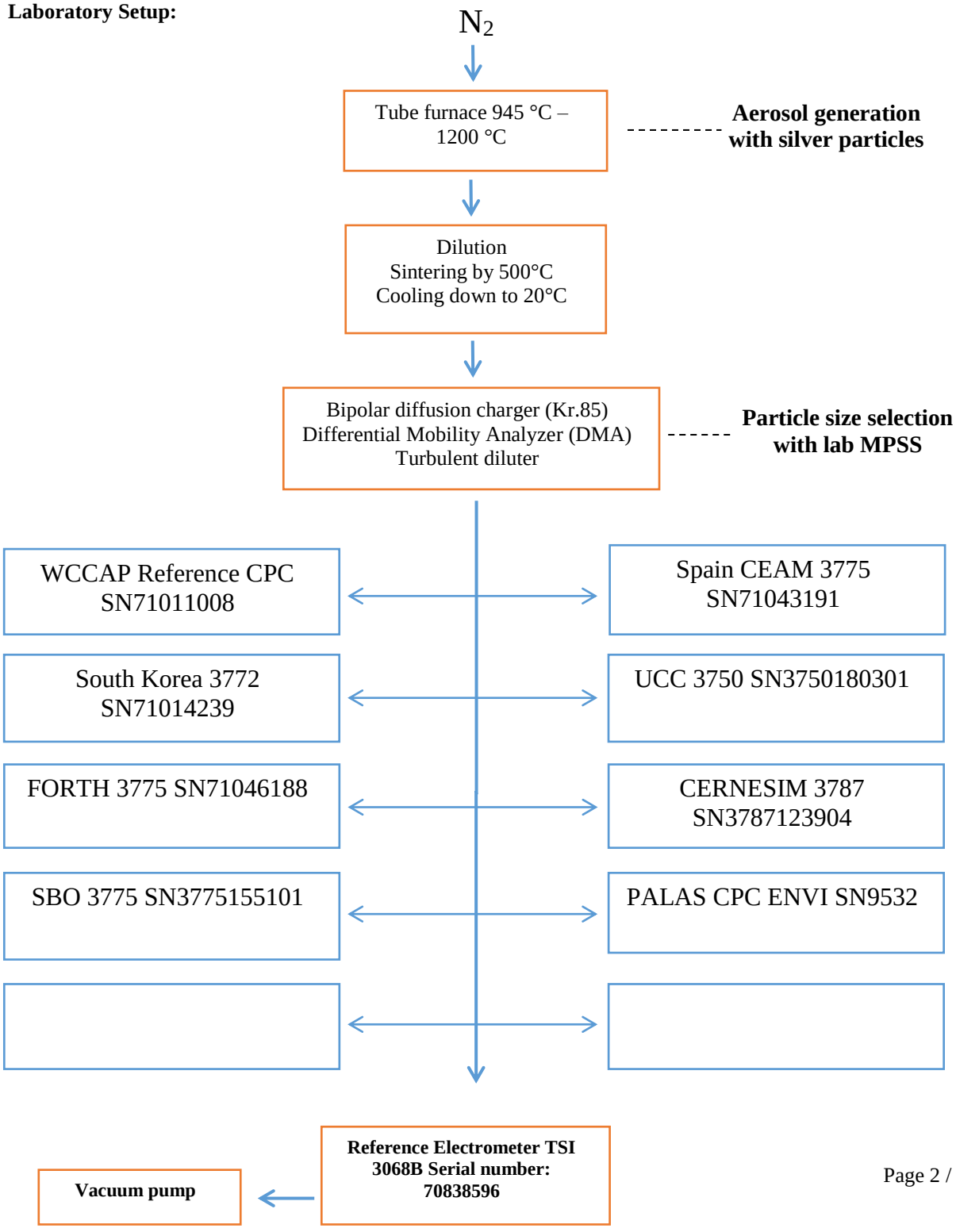
Laboratory Setup:



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Date of arrival of instrument in calibration lab:	*October 08, 2019*
Instrument:	*Condensation Particle Counter*
Model and serial number of instrument:	*CPC 3775 S/N 3775155101*
Result of physical inspection:	*no damages*
Result of functional test:	*no repair*
Internal parameters of instrument	*nominal flow rate 0.3 l/min*
Model and identification number of aerosol electrometer:	*TSI Electrometer Model 3068, S/N 70838596*
Electrometer calibration certificate:	*September 05, 2018, calibrated at PTB Braunschweig*
Corrections of electrometer, for instance, differing flow rate:	*Within tolerance range (+/-2%); reference: 4.0 l/min, measured: 4.00 l/min*
Software for recording:	*LabView 2010; National Instruments; Program „LabCount.vi“*
Date of calibration:	*October 08, 2019*
Lab temperature and pressure:	*22.2°C, 985 mbar*
Measured aerosol flow rate of CPC:	*0.294 (292) l/min*
Uncertainty in measured flow rate:	*3%*
Flowmeter used:	*Gilian Gilibrator V; S/N 1711008-S, January, 2018*
Particles and gases used for calibration:	*silver particles and nitrogen*
Method of particle generation:	*tube furnace generator*
Zero measurement of instrument:	*0 particles/cm³ in 5 minutes*

Results (using pulse output):

Particle size (nm)	***40***	***30***	***20***	***15***	***10***
Number concentration (cm-3)	1249	1553	1179	1144	1091
Counting efficiency η	*0.99*	*1.00*	*0.99*	*0.98*	*0.93*
Particle size (nm)	***09***	***08***	***07***	***06***	***05***
Number concentration (cm-3)	1319	1884	1630	1548	598
Counting efficiency η	*0.92*	*0.90*	*0.86*	*0.80*	*0.68*
Particle size (nm)	***40***				
Number concentration (cm-3)	1042				
Counting efficiency η	*0.99*				

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Special Information regarding to the Candidate:

Was it necessary to:	yes/no	information
do a second run	no	-
clean the optics	no	-
clean the nozzle	no	-
clean the saturator	no	-
change the wick	no	-
change the laser	no	-
change internal settings	no	-

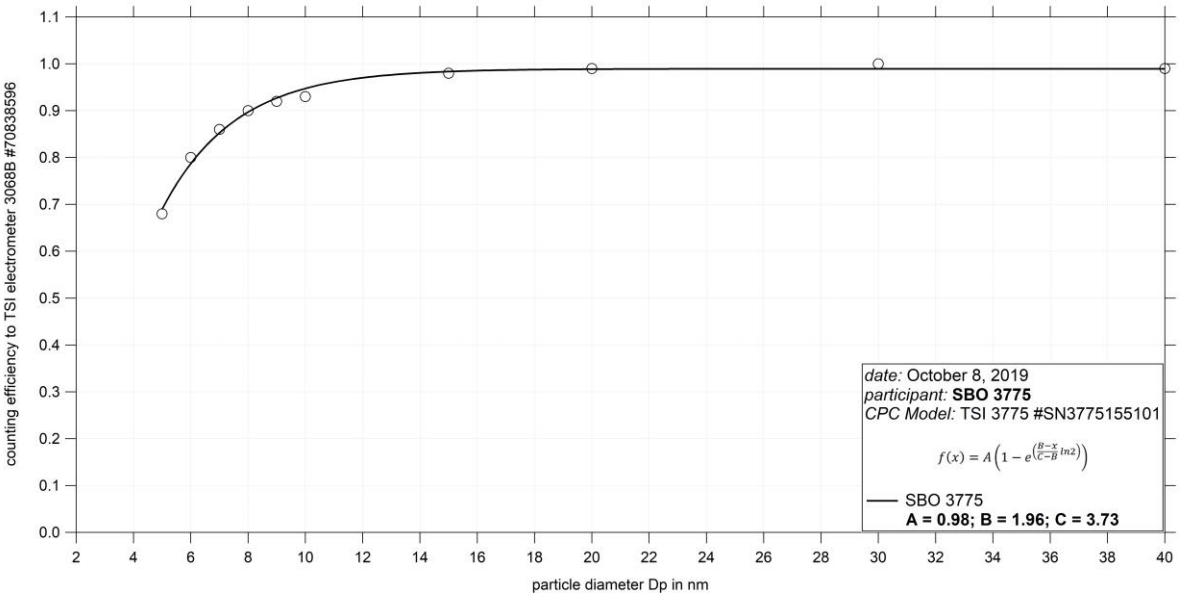

Fig. 1: Counting efficiency for SBO CPC 3775 S/N 3775155101 against aerosol electrometer 3068 S/N 70838596; silver particles between 5 and 40 nm were used for calibration; the calculated Dp50 is 3.73 nm.

Status information:

Status	***T SAT***	***T CON***	***T OPT***	***T CAB***	***P AMB***
from display	39.0	14.0	40.0	31.6	99.2
Status	***P OR***	***P NO***	***Laser***	***LV***	***flow***
from display	53.2	0.067	38mA	full	0.294 (292)

Date of issue: *October 08, 2019*
Reviewed: TROPOS / Kay Weinhold

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