Report WCCAP
Calibration Workshop „Condensation Particle Counters“ November 2002

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The intercomparison and calibration workshop for Condensation Particle Counters (CPC) was held at the World Calibration Center for Aerosol Physics in Leipzig in October 2002. The workshop was jointly coordinated with the GAWTEC IV course at Schneefernerhaus, Zugspitze, also held in October 2003. Three people attending the GAWTEC course participated also with their instruments in the intercomparison and calibration workshop.
The entire time for preparing and conduction the workshop covered approximately three man month.

Calibration procedure:

A tube furnace generator in combination with a Differential Mobility Analyzer (DMA) was used produce silver particles.

Calibration of the aerosol electrometer using several TSI 3010 CPCs and a 40 nm monodisperse aerosol. The uncertainty of the TSI 3010 have been in the range of few percent.

Calibration of two CPCs of the WCCAP as comparison counters using an aerosol electrometer as reference instrument.

CPCs were tested for functioning using a monodisperse 40 nm aerosol and comparing the number concentration with the comparison counters.

A TSI technician attended the workshop to electronically check the CPCs and if possible to repair them. The DWD and Izana UCPCs were repaired. The low flow modus of the UCPC from Izana could however not be fixed within the frame of the workshop. The 7610 and 3760 from DWD and NOAA, respectively, could also not be repaired. TSI is not able to support these counters any longer.

Determination of the counting efficiency curve of the TSI 3010, 7610, and 3760 CPCs in the size range from 7-40 nm using monodisperse aerosols.

Determination of the counting efficiency curve of the TSI 3025 UCPC in the size range from 3-40 nm using monodisperse aerosols.

Calibration of the Pollak Counter

Particle Counters in the workshop:

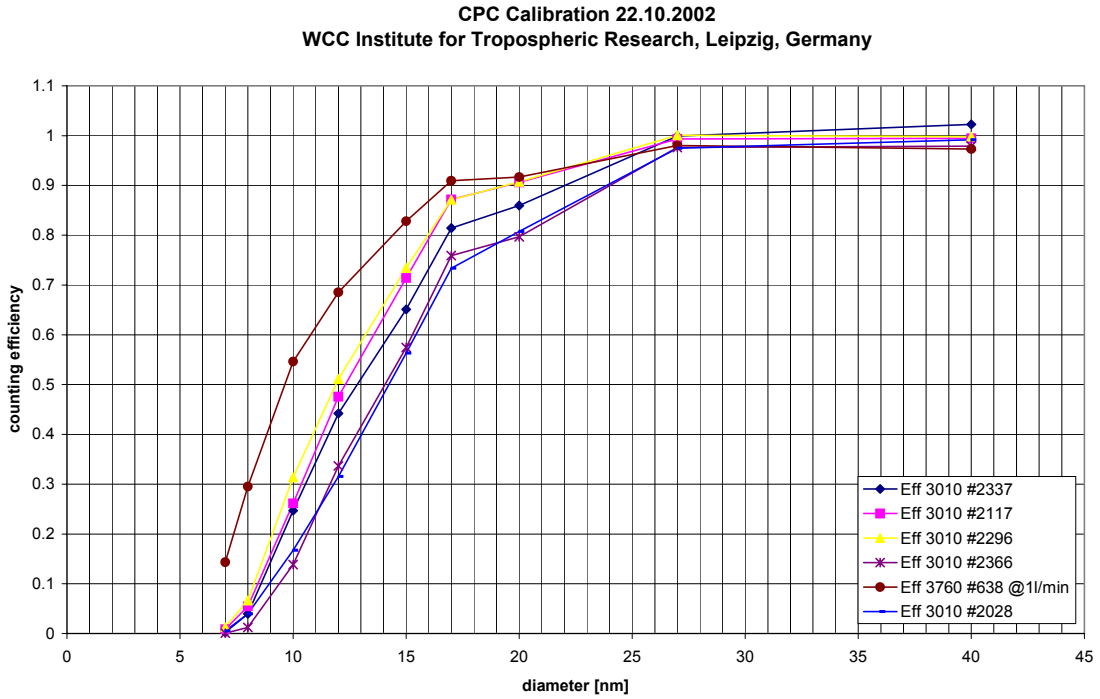
Organization	CPC	SN	Status	Action	Result	Calibration
IFT	3010	2006	ok			Ok
IFT	3010	2114	ok			Ok
IFT	3025	1307	ok			Ok
IFT	3025	1109	ok			Ok
IFT	3010	2337	ok			Ok
					High Flow	
INM	3025	1160	**high**	TSI service	Ok	Ok
Finnland	3010	2366	ok			Ok
CSIRO	3760	638	ok			Ok
DWD	7610	n.a.	**low**	TSI service	defect	No
DWD	3025	1106	**high**	TSI service	Ok	Ok
Mace Head	3010	2296	ok			Ok
Mace Head	3010	2275	ok			defect
NOAA 3010	3010	2028	ok			Ok
NOAA 3760	3760	597	**low**	TSI service	defect	No
PSI	3010	2154	ok			Ok
Mace Head	Pollak Counter		ok			Ok

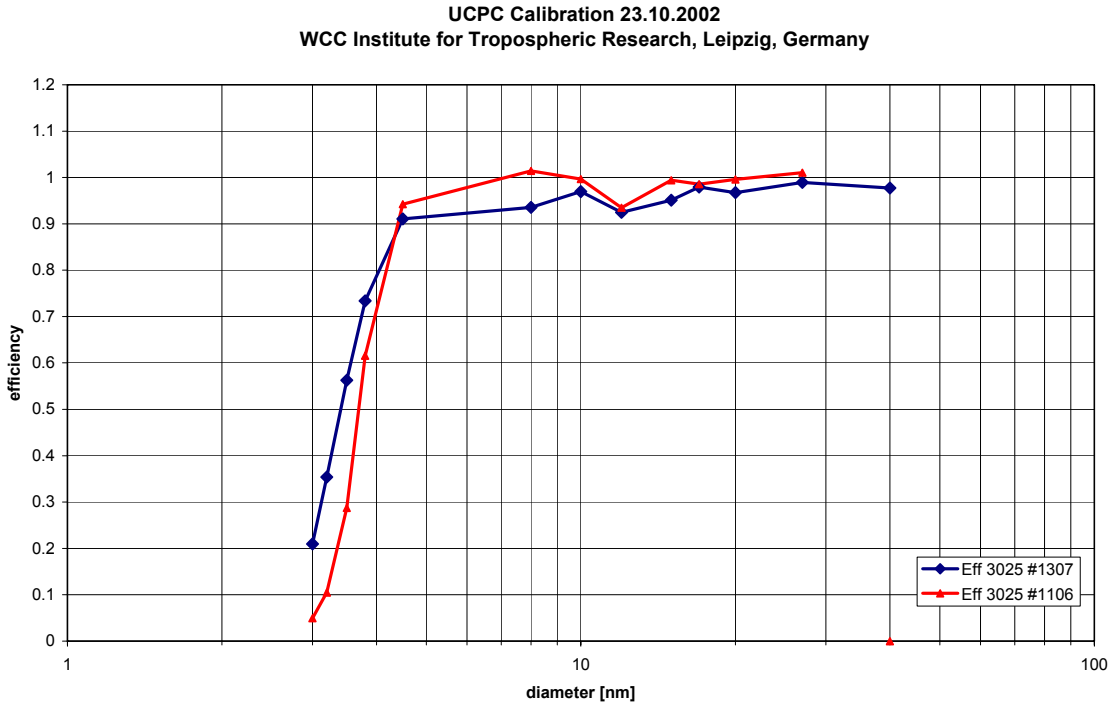
The final counting efficiencies were sent to the participating institutes. Because of the different applications of the CPCs, no individual Standard Operation Procedures (SOP) were developed during the workshop. The participant received a general SOP for CPCs used to measure total number concentrations.

Participant list:

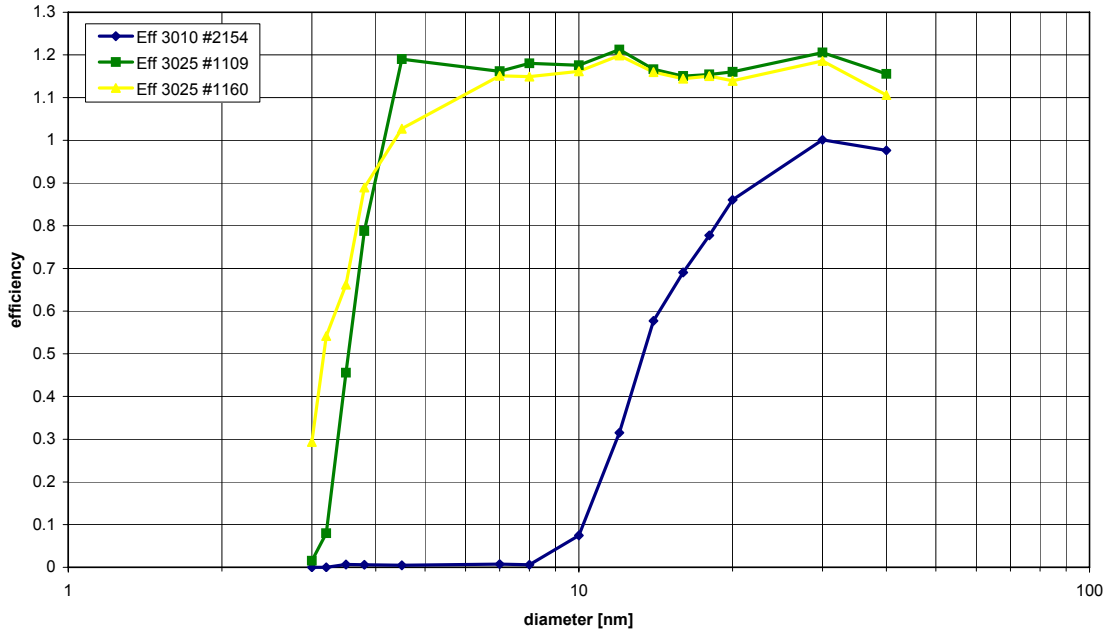
Name	Institution	Country
Treffert, Ulrich	Federal Environmental Agency	Germany
Kelly, Brendan	Galway, (Mace Head)	Ireland
Pedro Miguel Ramero Campos	I.N.M, (Izana)	Spain Canary Islands
Kaminski, Uwe	German Weather Service (DWD), Hohenpeissenberg	Germany
Paulsen, Dwane	PSI	Switzerland
Andrews, Betsy	NOAA/CMDL	USA
Komppula, Mika	FMI	Finland
Graham, Bim	CSIRO	Australia
Ouchene, Bouziane	ONM	Algeria
Wilhelm, Reinhard T.	German Weather Service (DWD), Hohenpeissenberg	Germany
Birgit Wehner	IfT	Germany
Thomas Tuch	IfT	Germany
Alfred Wiedensohler	IfT	Germany
Wolfgang Völker	TSI	Germany

Calibration Curves

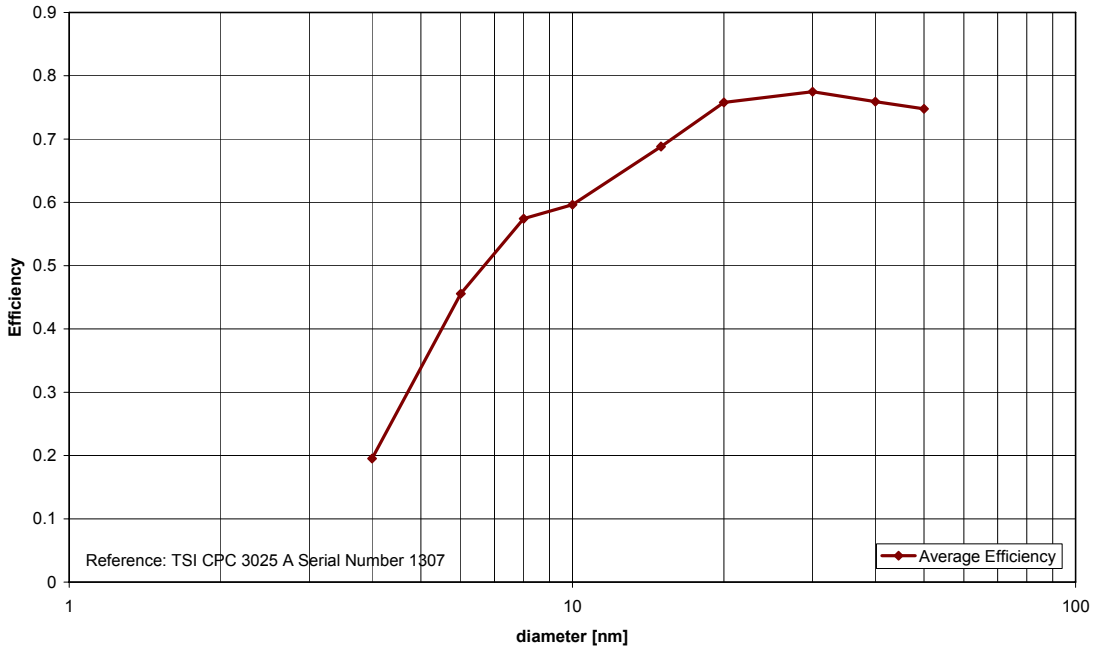




UCPC Calibration 24.10.2002
WCC Institute for Tropospheric Research, Leipzig, Germany



Average Efficiency of Nolan Pollak Counter



Comparison Laser OPC MetOne (Tamanrasset/Assekrem) – Aerodynamic Particle Sizer:

The people ask to calibrate of the Laser OPC MetOne during the workshop. However, this was not possible within the time period of the workshop. Instead, the OPC was intercompared with an Aerodynamic Particle Sizer (APS). The final result of the intercomparison will be send to Tamanrasset in April 2003.