

Intercomparison of Mobility Particle Size Spectrometers

<i>Project No.:</i>	MPSS-2020-2-3
<i>Principal Investigator:</i>	TROPOS
<i>Home Institution:</i>	TROPOS
<i>Participant:</i>	-
<i>Candidate:</i>	TROPOS MPSS Kap Verde
<i>Made by:</i>	TROPOS
<i>Counter (SN):</i>	TSI CPC 3010 SN: 2337
<i>Location of the quality assurance:</i>	TROPOS Leipzig, lab 118
<i>Comparison period:</i>	March. 30, 2020 – April. 1, 2020
<i>Last Intercomparison (with Project No.):</i>	

Summary of Intercomparison:

The TROPOS MPSS Kap Verde participated in the WCCAP Workshop in March 2020. The candidate passed the standards of ACTRIS and GAW.

Status March 20, 2020

Table No. 1:

Institute: TROPOS							
Station: Kap Verde							
Date of checking list: March 20, 2020							
Instrument/ Components	info	SN	Date/Code	CPC-Status		HV-Status	
MPSS/Classifier:	TROPOS	-		ST	-	OFF	0
Firmware Classifier:	-			CT	-	4mv	5.1
Firmware Software:	TROPOS		6.68	OT	-	800mv	1000.3
DMA type:	Hauke medium		2019	CabT	-	200mv	249.8
CPC model:	TSI CPC 3010	2337		AP	-	0	0
Firmware CPC:	-		-	OP	-		
radioactive source:	Kr85	-	Kr.85	NP	-		
Flow CPC (l/min):	0.999			LC	-		
Flow Inlet (l/min):	0.998						
Sheath air flow (l/min):	5.0						
Zero (#/cm ³):	0						
Maintenance							
Aerosol inlet:	checked and cleaned						
Aerosol Nafion dryer:	no						
Sheath Nafion dryer:	checked						
Source:	Kr85						
HV power supply:	checked						
DMA:	new TROPOS DMA 3/8" from 2019						
Aerosol/sheath RH/T- sensor:							
Pressure sensor:							
Filter:	checked						
NI-card:							
CPC:							
Impactor:							
Setup settings over night:							

Institute: TROPOS							
Station: Reference Instrument No.1							
Date of checking list: March 20, 2020							
Instrument/ Components	info	Serial Number	Date/Code	CPC-Status		HV-Status	
MPSS/Classifier:	TROPOS	No.1		ST	39.0	0 V	0
Firmware Classifier:				CT	22.0	5 mV	4.98
Firmware Software:	TROPOS 6.68			OT	40.0	800 mV	999.8
DMA type:	Hauke medium		142	CabT	28	200 mV	250.0
CPC model:	TSI 3772	3772141701		AP	100.1	0 V	0
Firmware CPC:	2.15			OP	78.0		
Radioactive source:	Kr.85	NER 8275	002/13	NP	2.8		
Flow Inlet (l/min):	0.990			LC	50		
Zero (#/cm ³):	0						

Institute: TROPOS							
Station: Reference T-CPC							
Date of checking list: March 20, 220							
Instrument/ Components	info	Serial Number	Cut off	CPC-Status			
CPC model:	TSI 3772		Dp50 10 nm	ST			
Firmware CPC:	2.15			CT			
Flow Inlet (l/min):	1.024			OT			
Zero (#/cm ³):	0			CabT			
				AP			
				OP			
				NP			
				LC			

PSL Scan: Latex 203 nm +/- 4 nm

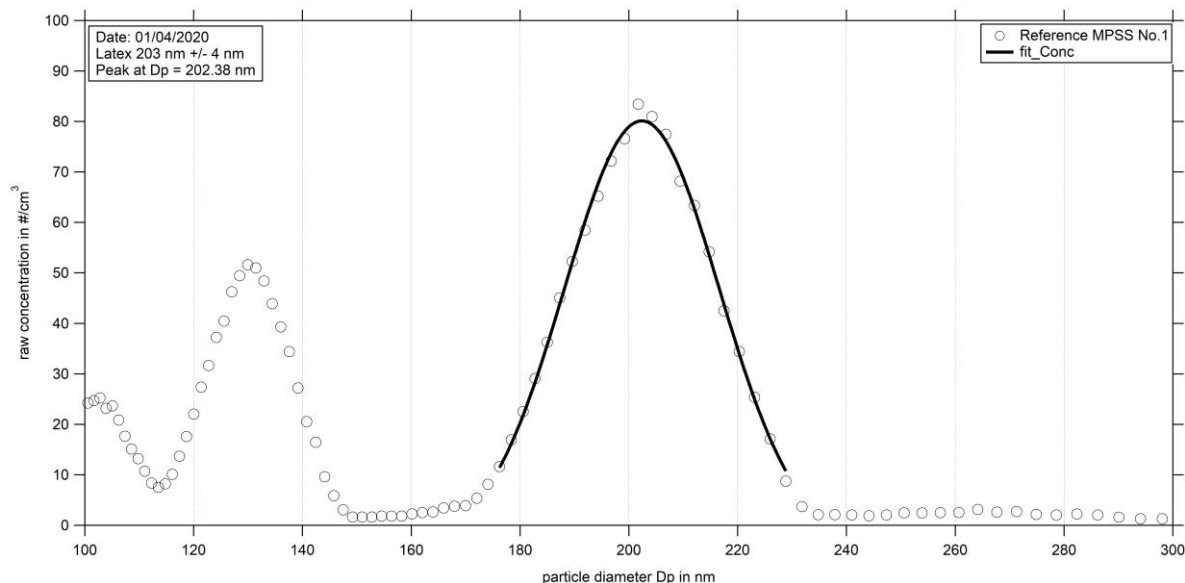


Figure 01: Measurement of latex 203 nm – TROPOS Reference Instrument No. 1: Particle size distribution of latex 203 nm on April 01st, 2020. The peak shows at 202.38nm

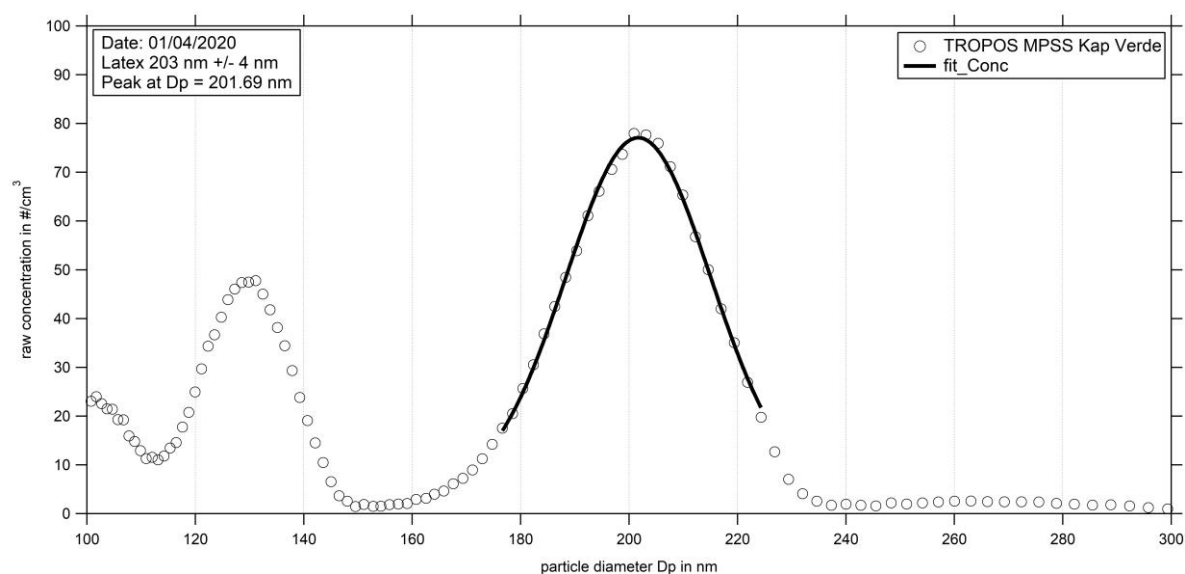


Figure 02: Measurement of latex 203 nm – TROPOS MPSS Kap Verde: Particle size distribution of latex 203 nm on April 01st, 2020. The peak shows at 201.69nm.

Intercomparison between TROPOS Reference Instrument No. 1 and TROPOS MPSS KapVerde 30.03.2020 18:00PM – 01.04.2020 06:00AM

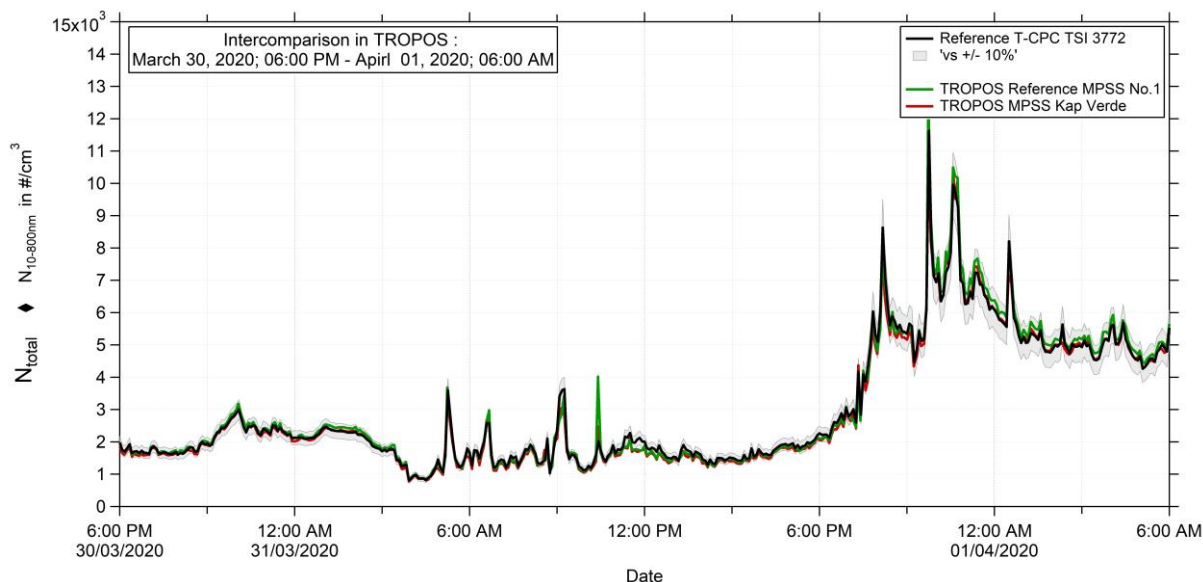


Figure 03: Time series (Mar. 30, 2020 6 PM – April. 01, 2020 6 AM) of the integrated particle number concentration ($N_{10-800nm}$) of the MPSS and total number concentration (N_{total}) of the Reference TSI-CPC Model 3772. Multiple charge correction, internal diffusion losses, CPC flow corrections. The candidate is running with the TSI Kr.85 source.

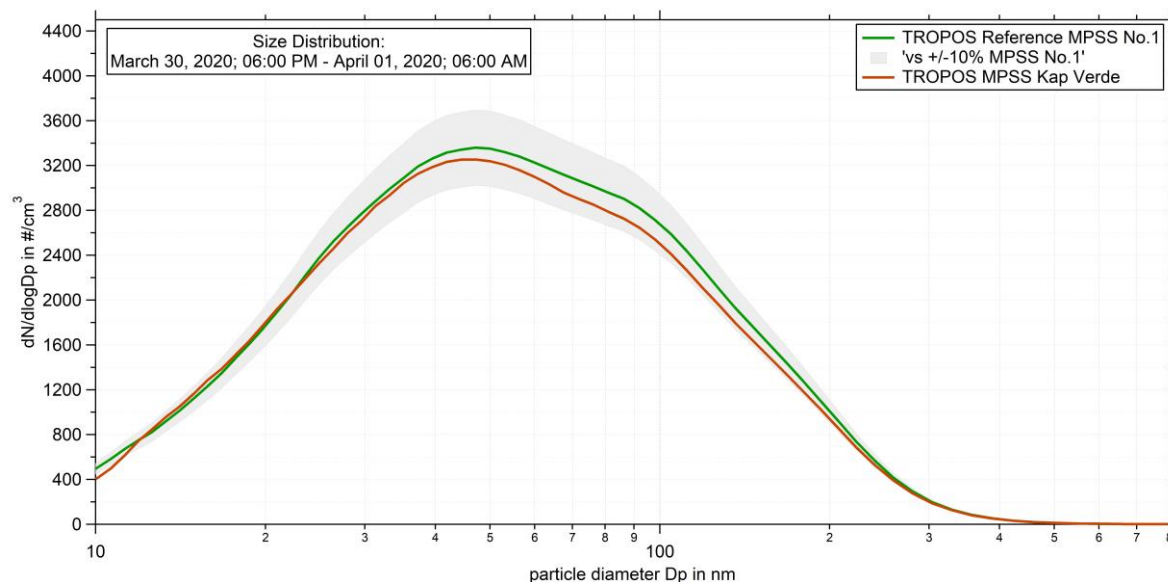


Figure 04: Particle size distribution for TROPOS Reference MPSS No.1 and TROPOS MPSS Kap Verde, flow corrections, multiple charge correction and diffusion loss corrections are included.

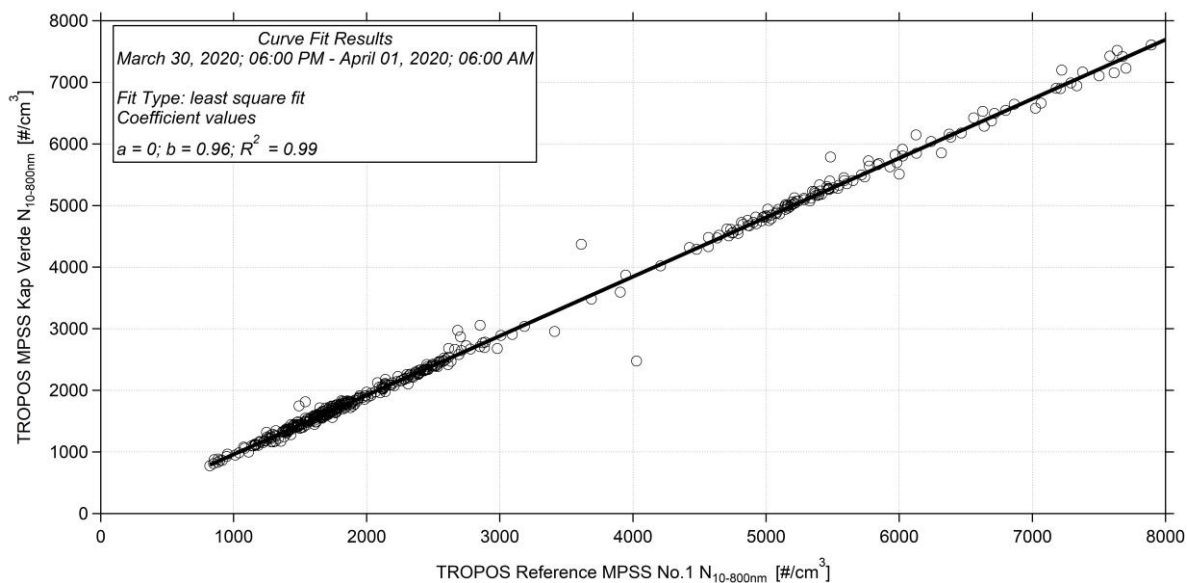


Figure 05: Linear regression between the number concentration of the TROPOS Reference MPSS No. 1 and TROPOS MPSS Kap Verde.

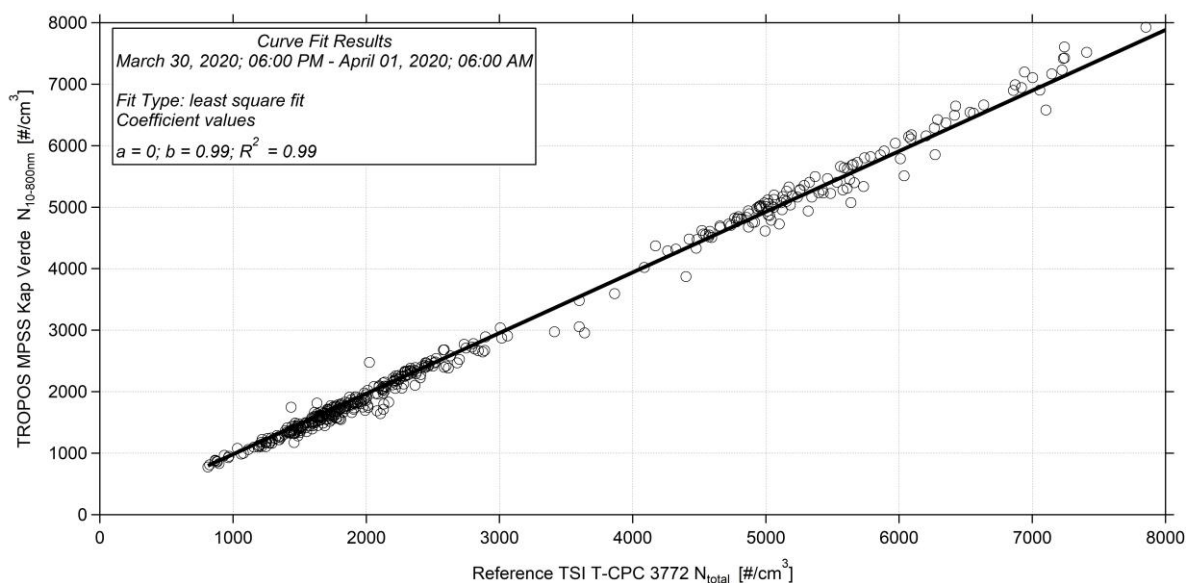


Figure 06: Linear regression between the number concentration of the TROPOS Reference T-CPC Model 3772 and TROPOS MPSS Kap Verde.

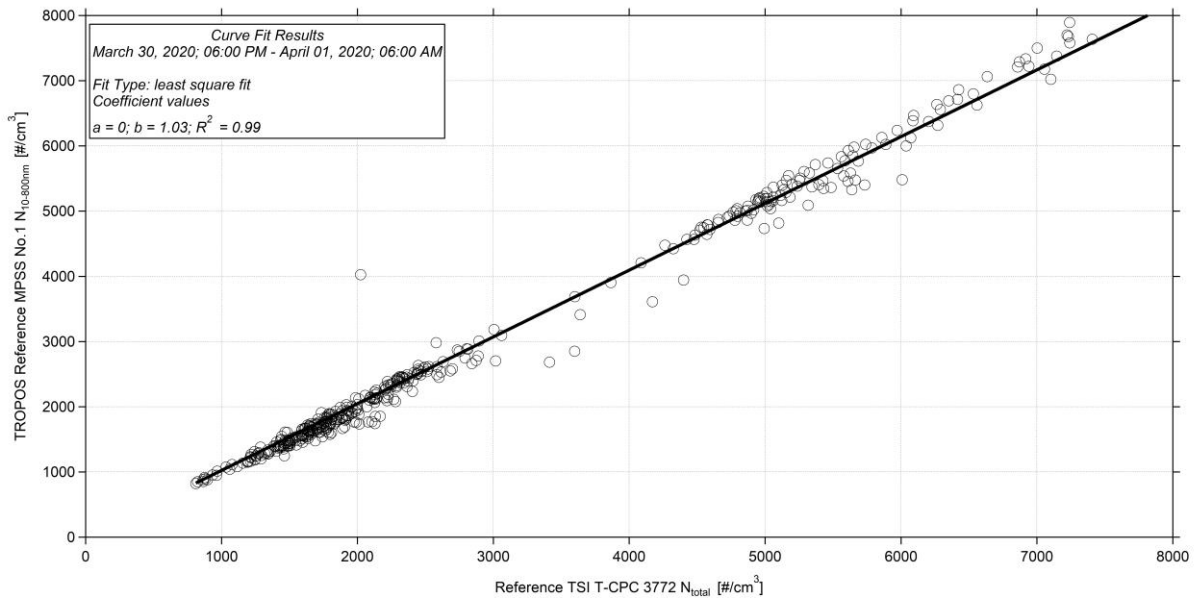


Figure 07: Linear regression between the number concentration of the TROPOS Reference T-CPC Model 3772 and TROPOS Reference Instrument No. 1.