

## Intercomparison of Condensation Particle Counter

*Project No.:* CPC-2018-7-2

*Principal Investigator:* Pierre Tulet

*Home Institution:* LACy Laboratoire de l'Atmosphere et des Cyclones

*Participant:* **France - Reunion**

*Candidate:*  
*Counter (SN):* TSI CPC Model 3776; SN: 3776163301

*Location of the quality assurance:* TROPOS Leipzig, lab 130

*Comparison period:* October 23, 2018

*Last Intercomparison (with Project No.):*

*TROPOS Reference Instrument:* Electrometer: TSI model 3068B  
#70838596, Last calibration in September 2018

*Additional Equipment:* Bubble flow meter 'Giliblator', Gilian (Sensidyne)  
#1711008-S, Last calibration in November 2017

### Summary of Intercomparison

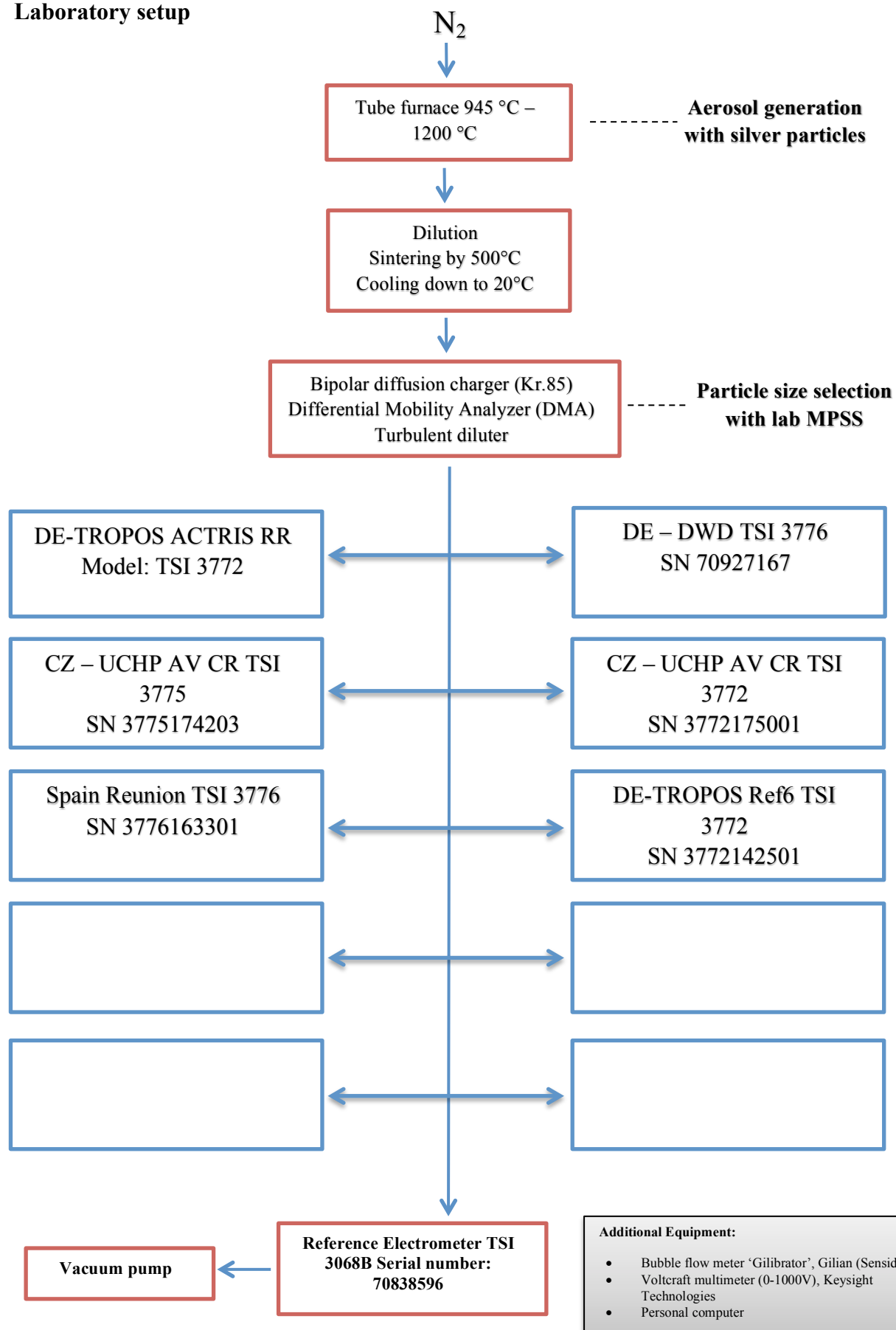
#### *Pre-Status:*

The candidate did not pass the quality standards of ACTRIS and GAW. The candidate was dirty and had internal flow problems. It was necessary to clean tubes, change the membrane of the pump, tubes and recalibrate the instrument.

#### *Final-Status:*

The candidate passed the quality standards of ACTRIS and GAW. The candidate reached 100% efficiency at 40 nm. The Dp50 is at 2.0 nm. The CPC efficiency curve corresponds to the standard of ACTRIS and GAW.

## Laboratory setup

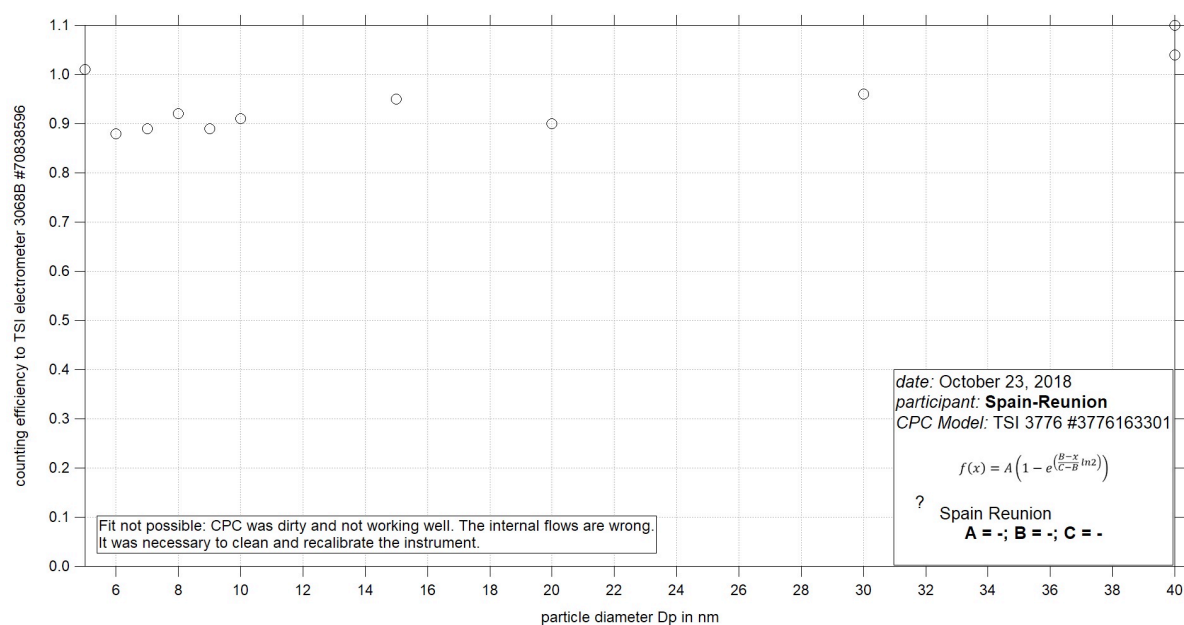


**Status of the candidate:**

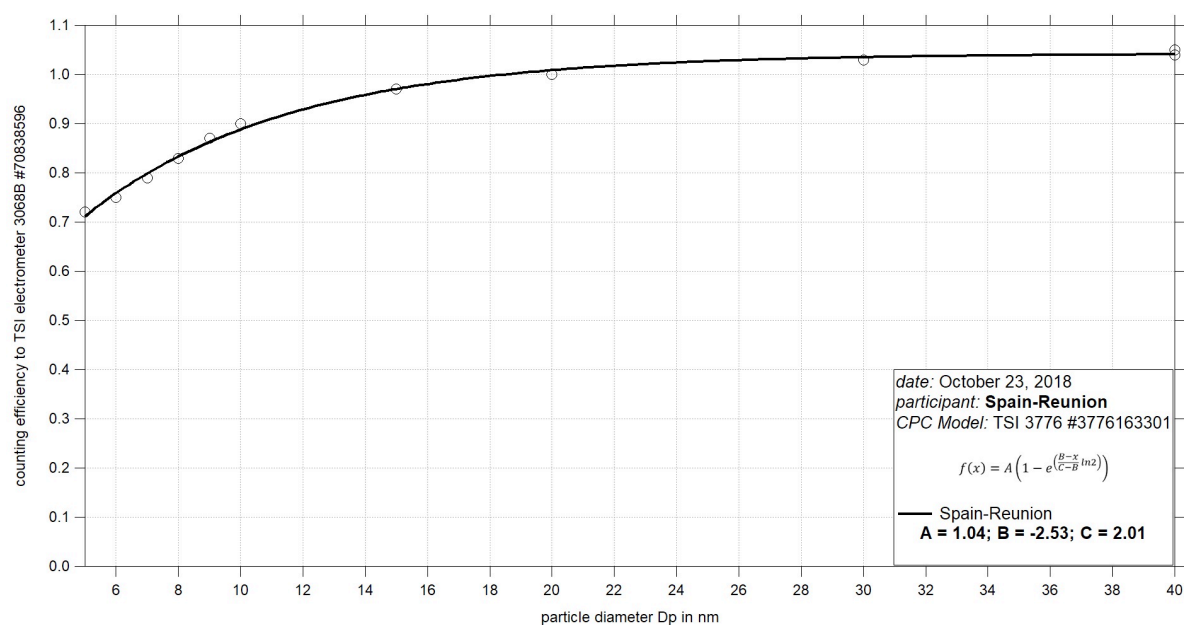
<i>CPC status</i>	Pre-Status		Final Status	
<i>power/status</i>	LED green	-	LED green	-
<i>saturator temp</i>	39.0	°C	39.0	°C
<i>condenser temp</i>	10.0	°C	10.0	°C
<i>optics temp</i>	40.0	°C	40.0	°C
<i>cabinet temp</i>	29.4	°C	31.3	°C
<i>ambient pressure</i>	99.4	kPa	99.2	kPa
<i>orifice pressure</i>	53.0	kPa	52.8	kPa
<i>nozzle pressure</i>	3.06	kPa	3.4	kPa
<i>laser current</i>	25	mA	25	mA
<i>liquid level</i>	Full	-	Full	-
<i>Aerosol flow (l/min)</i>	1.430 (35)	l/min	1.479 (48)	l/min

**Special Information regarding to the Candidate:**

<i>Was it necessary to:</i>	yes/no	information
<i>do a second run</i>	yes	Dirty and internal flow problem
<i>clean the optics</i>	yes	checked
<i>clean the nozzle</i>	yes	checked
<i>clean the saturator</i>	no	checked
<i>change the wick</i>	yes	Checked - changed
<i>change the laser</i>	no	
<i>change internal settings</i>	yes	Calibrate all flows, change internal filter, membrane in pump and few tubes

**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: Status**

$D_p$ in nm	counting efficiency
40 nm (start)	<b>1.04</b>
30 nm	<b>0.96</b>
20 nm	<b>0.90</b>
15 nm	<b>0.95</b>
12 nm	-
10 nm	<b>0.91</b>
9 nm	<b>0.89</b>
8 nm	<b>0.92</b>
7 nm	<b>0.89</b>
6 nm	<b>0.88</b>
5 nm	<b>1.01</b>
40 nm (end)	<b>1.10</b>

**CPC efficiency curve of the candidate: Final-Status****Figure 01:** CPC efficiency curve. Based on Electrometer TSI 3068B. Serial number: 70838596**Measured data of the candidate: Status**

<i><math>D_p</math> in nm</i>	counting efficiency
<b>40 nm (start)</b>	<b>1.04</b>
30 nm	<b>1.03</b>
20 nm	<b>1.00</b>
15 nm	<b>0.97</b>
12 nm	-
10 nm	<b>0.90</b>
9 nm	<b>0.87</b>
8 nm	<b>0.83</b>
7 nm	<b>0.79</b>
6 nm	<b>0.75</b>
5 nm	<b>0.72</b>
<b>40 nm (end)</b>	<b>1.05</b>