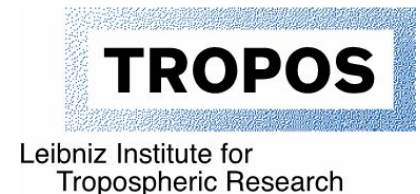


Results of the OPSS Intercomparison Workshop 2014

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ACTRIS-2 WP3 Workshop Athens 10-12 November 2015



Overview

- The first workshop for Aerodynamic Particle Size Spectrometers (APS) and Optical Particle Size Spectrometers (OPS) took place at TROPOS from Sep. 29 to Oct 3.
- The aim of the workshop was to document the quality of size spectrometers used at monitoring stations.
- The workshop was organized as follows
 - Inter-comparison measurements
 - Servicing instruments
 - Selection of ‘reference instruments’
 - Inter-comparison measurements

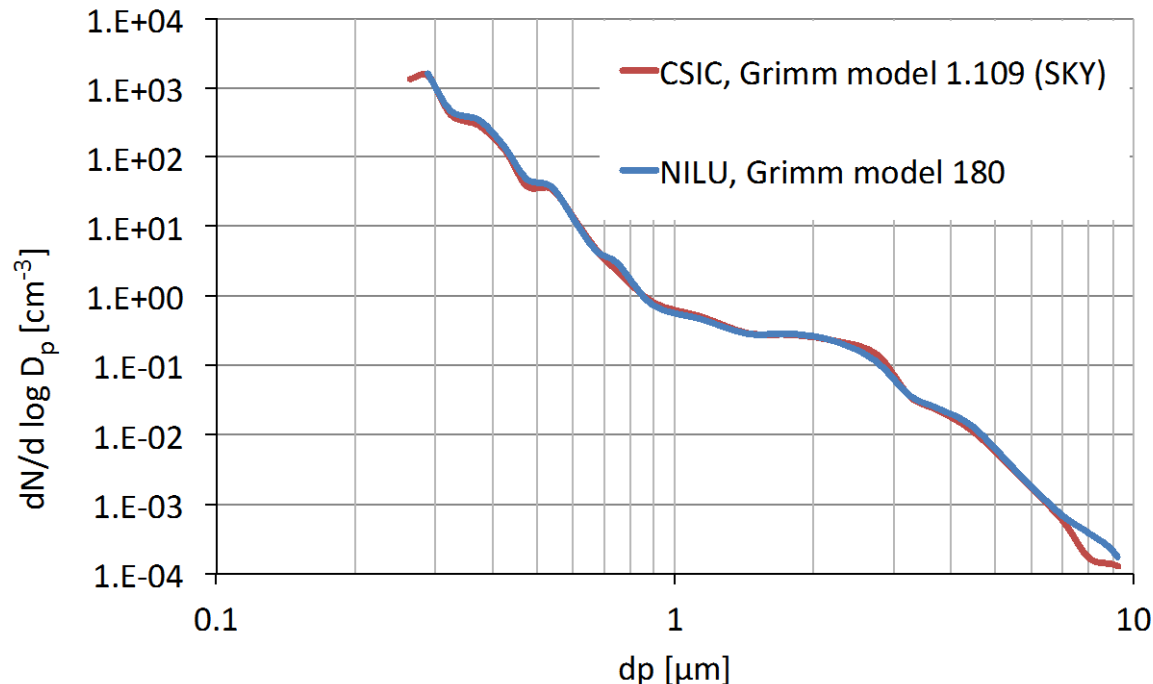
List of instruments and participants

Institute	Participant	Instruments
CSIC/IDAEA	Noemi Perez	GRIMM 180-MC GRIMM 1.109 (Sky)
LSCE / SIRTA		GRIMM 1.108
PSI	Erik Herrmann	2 x GRIMM 1.108
ISAC	Angela Marinoni Cecilia Tirelli	GRIMM 1.108 FAI OPC
NILU		GRIMM 190
LaMP	Mickael Ribeiro, Jean Marc Pichon	GRIMM 1.108 WELAS
N.C.S.R.	Prodromos Fetfatzis	GRIMM 1.107
FORTH		TSI model 3330
TROPOS	Thomas Müller	TSI model 3330
LACY/OPAR		TSI model 3330
LabAer		TSI model 3330
LPC2E/CNRS	Damien Vignelles	LOAC
UBA		Grimm model 1.1

Selection 'Workshops reference instruments'

Grimm particle spectrometer

- Various test were done by Grimm staff
- Two instruments with good performance values were selected as 'reference instruments'

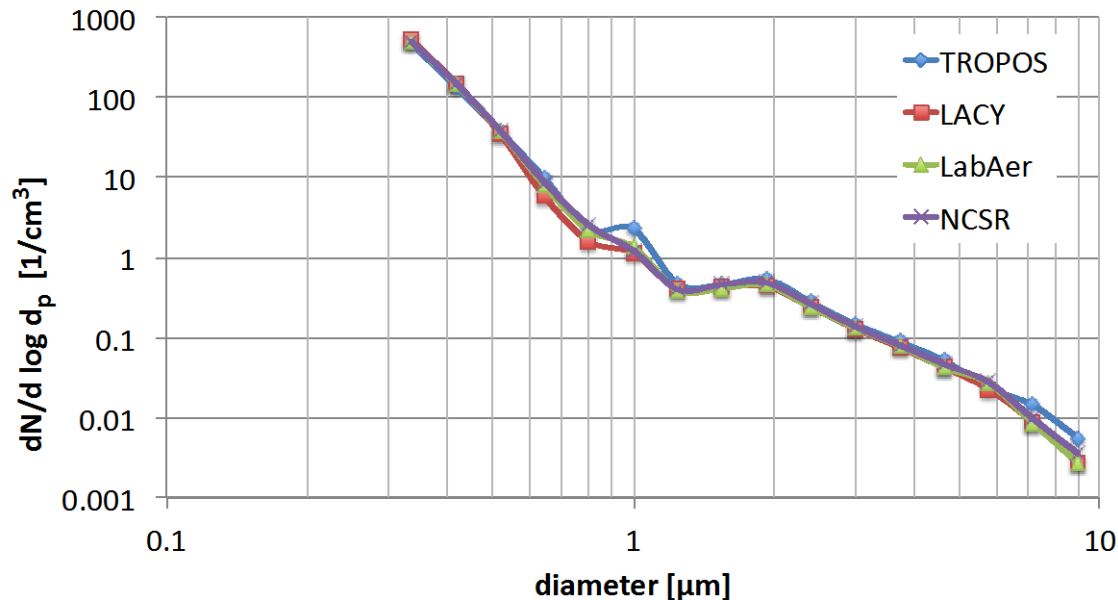


- Good agreement between workshop reference instruments.

Workshops 'reference instruments'

TSI particle spectrometer

- All four TSI model 3330 size spectrometers agree quite well.
- The TROPOS instrument shows a higher number concentration at 1 μm . Later it was found that this hump was caused by a fluff in the cell.



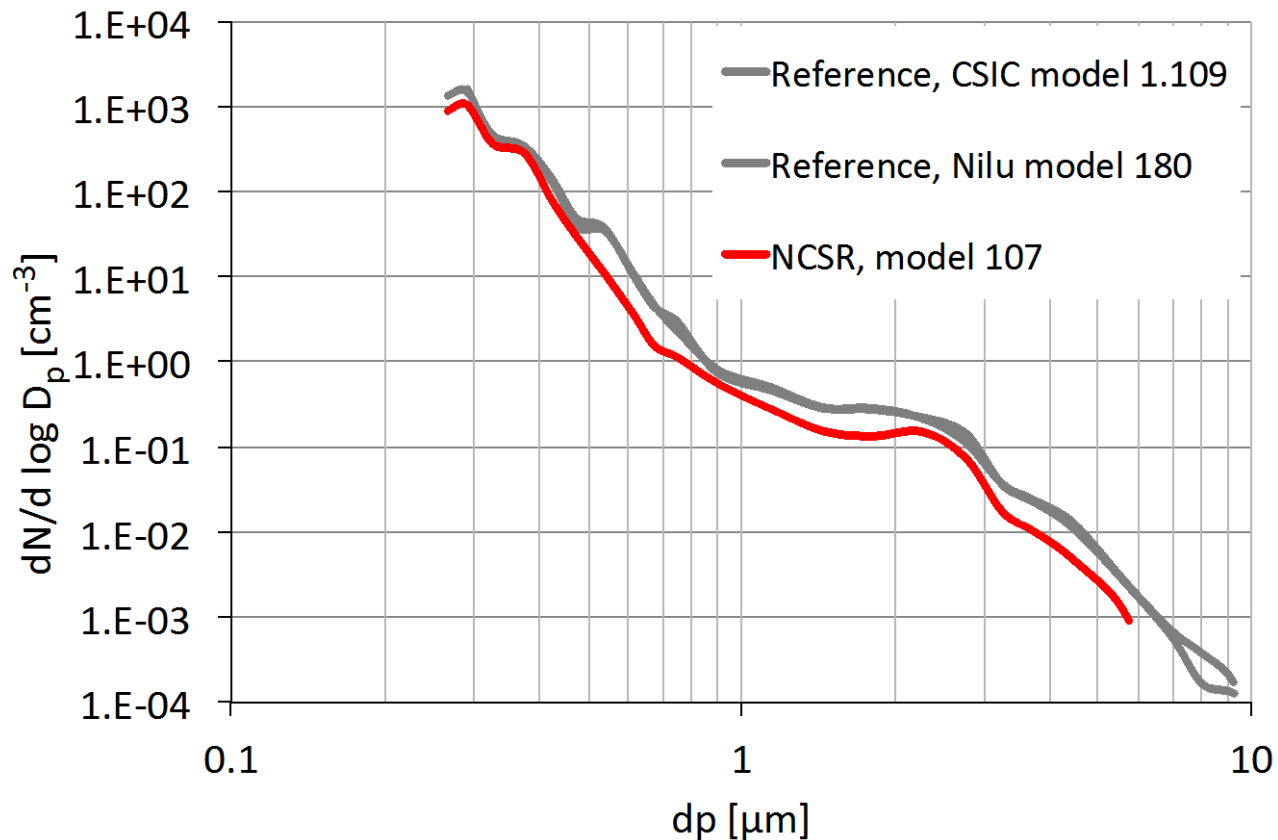
- LACY, LabAer and FORTH can be used as reference instruments.

NCSR, Grimm model 1.107

Instrument check:

- Original pump was replaced by a wrong not sealed pump.
- Mirror screw in wrong position.

Comparison to *workshop reference*:

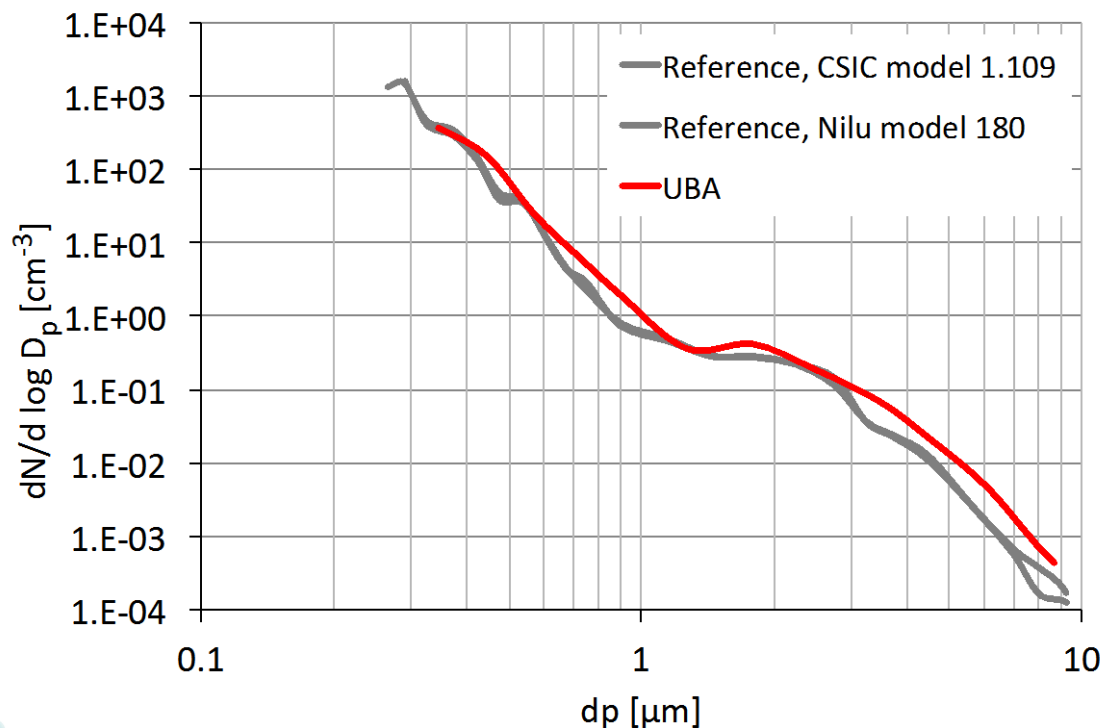


UBA, Grimm model 1.108

Instrument check:

- Several severe problems with self test

Comparison to *workshop reference*:

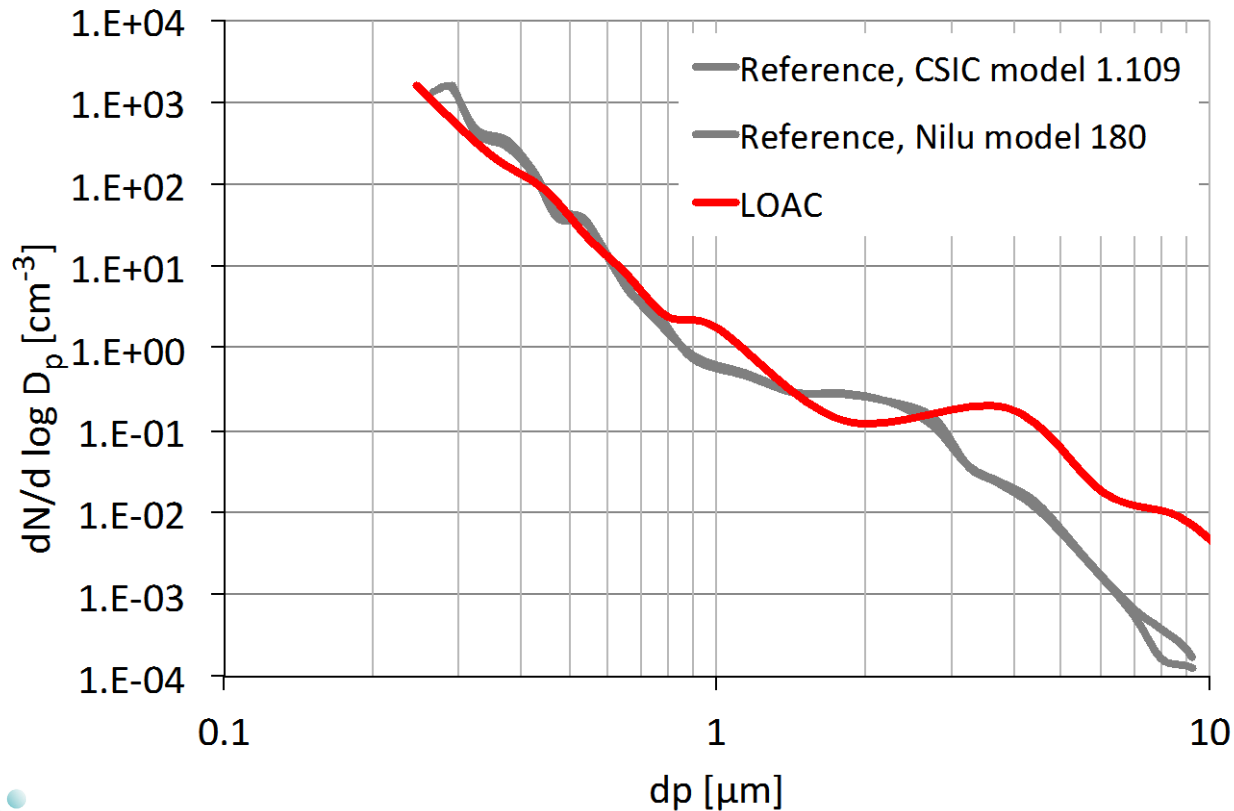


LPC2E/CNRS , LOAC

Instrument check:

- Custom made instrument, no checks done

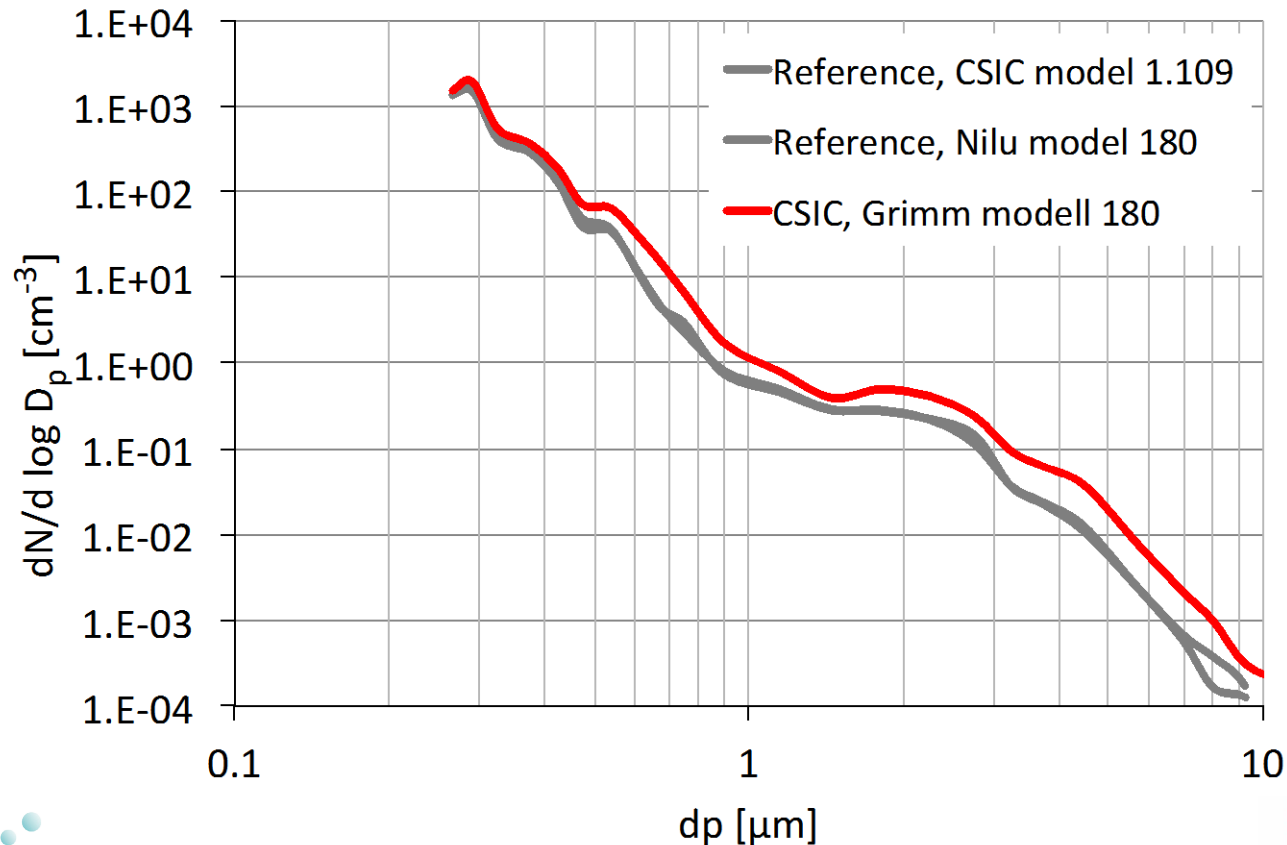
Comparison to *workshop reference*:



Instrument check:

- Instrument passed technical checks. Deviation to reference instruments points to a wrong instrument calibration. Instrument was send to Grimm Aerosol for recalibration.

Comparison to *workshop reference*:

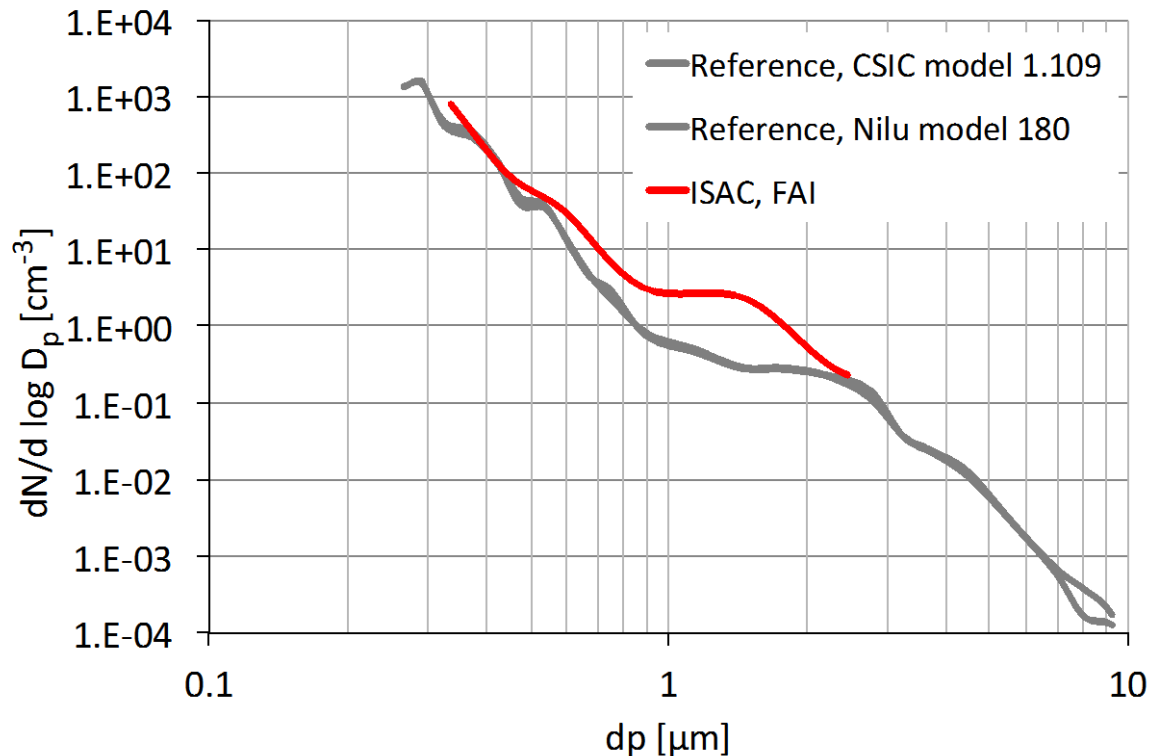


ISAC, FAI OPC

Instrument check:

- No experience with that type of instruments. No checks beside flow checks were done.

Comparison to *workshop reference*:

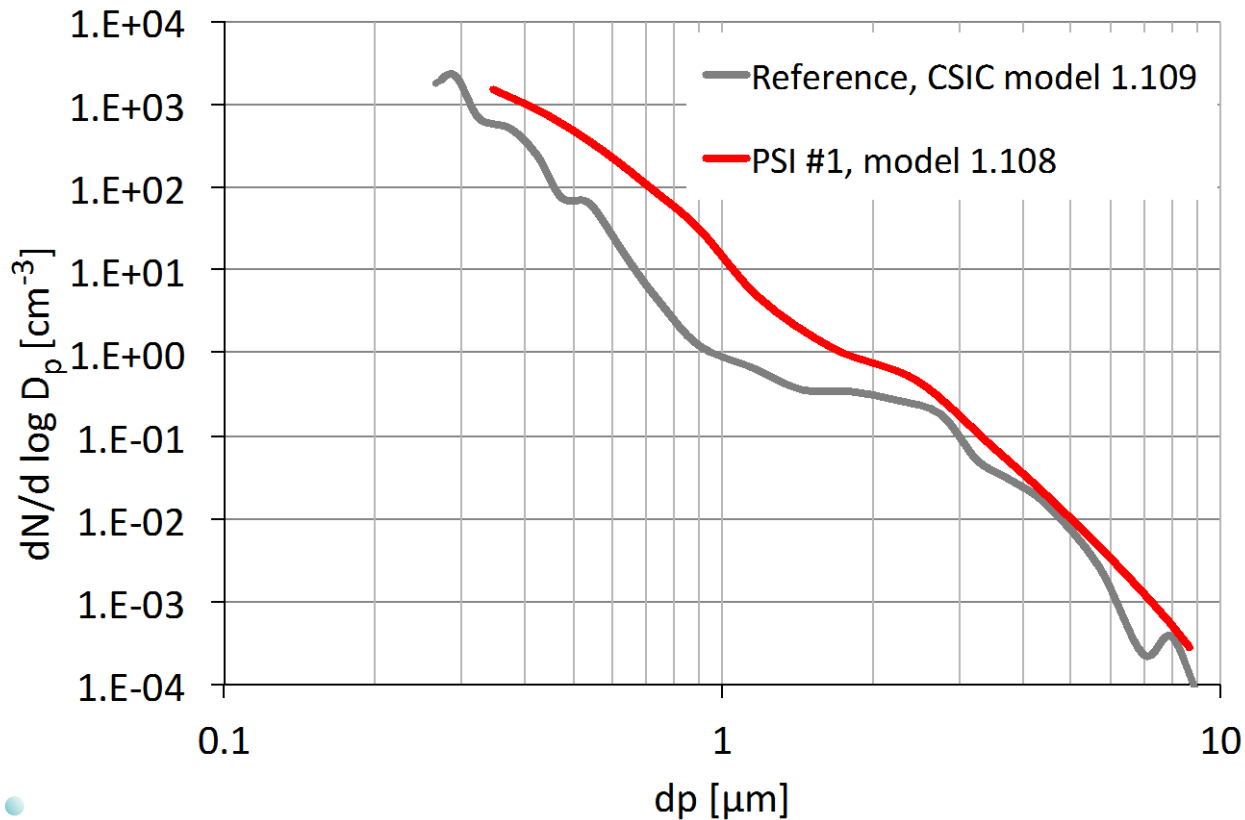


PSI #1, Grimm model 1.108

Instrument check:

- Optical cell dirty
- No backup filter
- Wrong and untighten pump

Comparison to *workshop reference*:

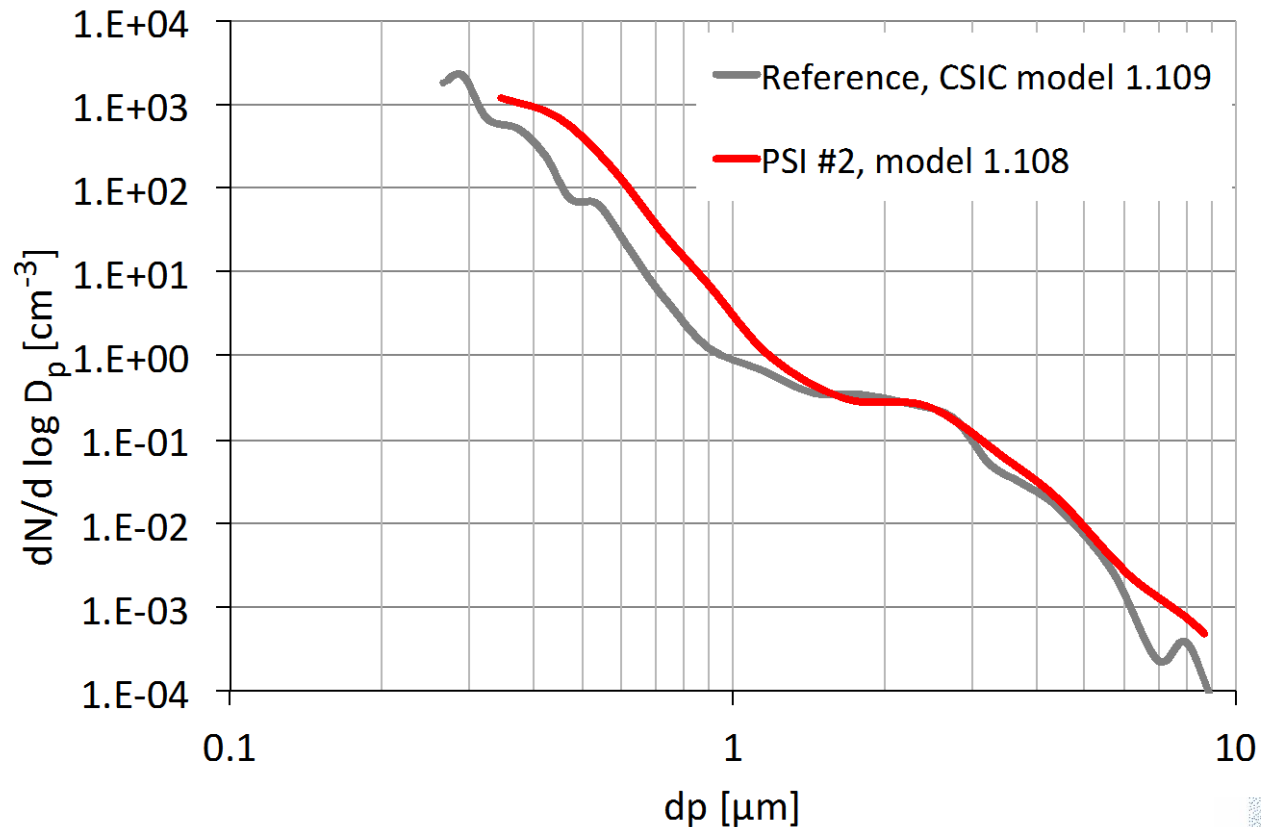


PSI #2, Grimm model 1.108

Instrument check:

- Optical cell dirty
- Wrong backup filter
- Wrong and untighten pump

Comparison to *workshop reference*:

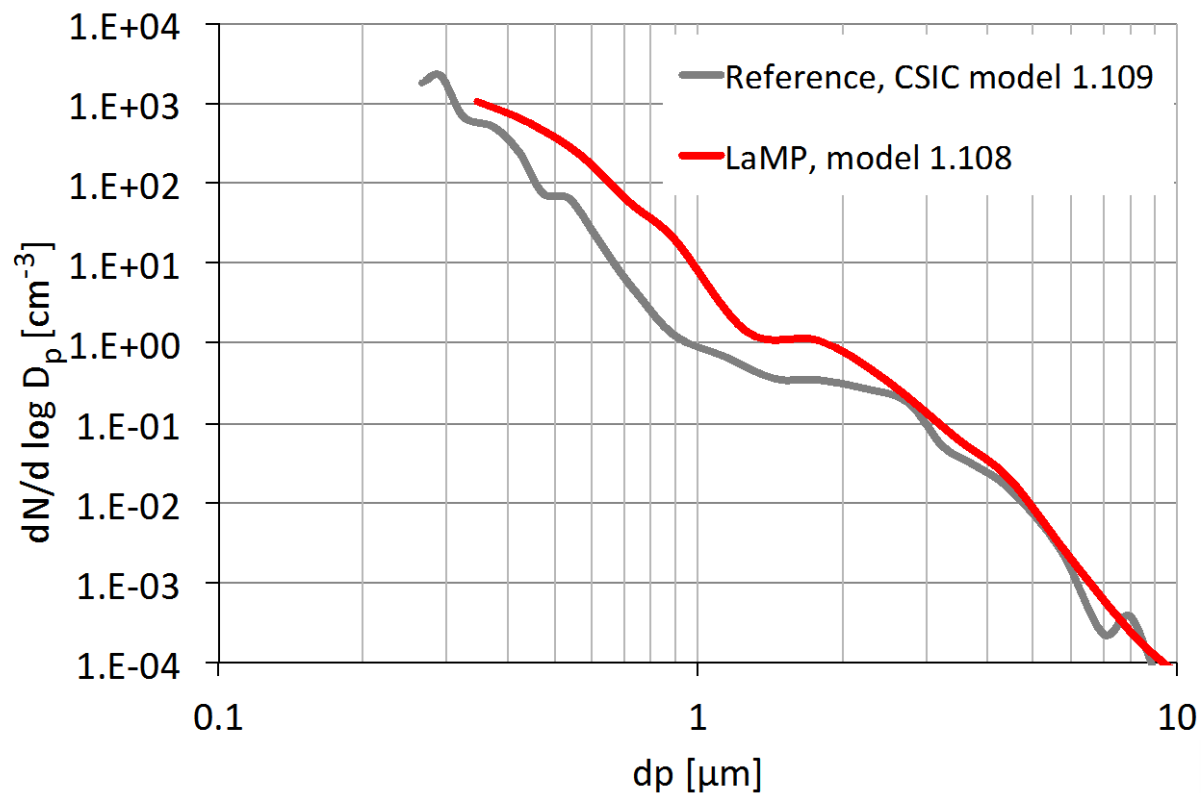


LaMP, Grimm model 1.108

Instrument check:

- Optical cell dirty
- Wrong backup filter

Comparison to *workshop reference*:

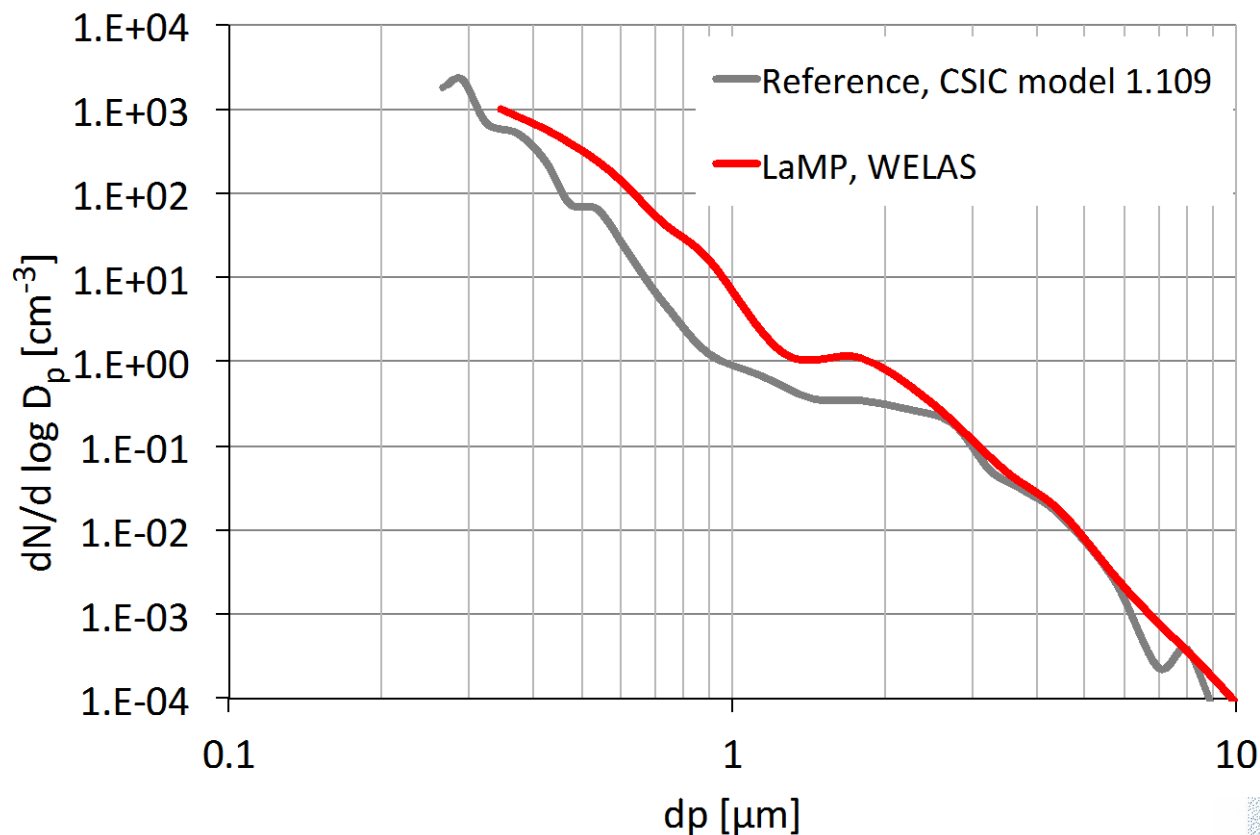


LaMP, WELAS

Instrument check:

- No experience with that instrument type.

Comparison to *workshop reference*:

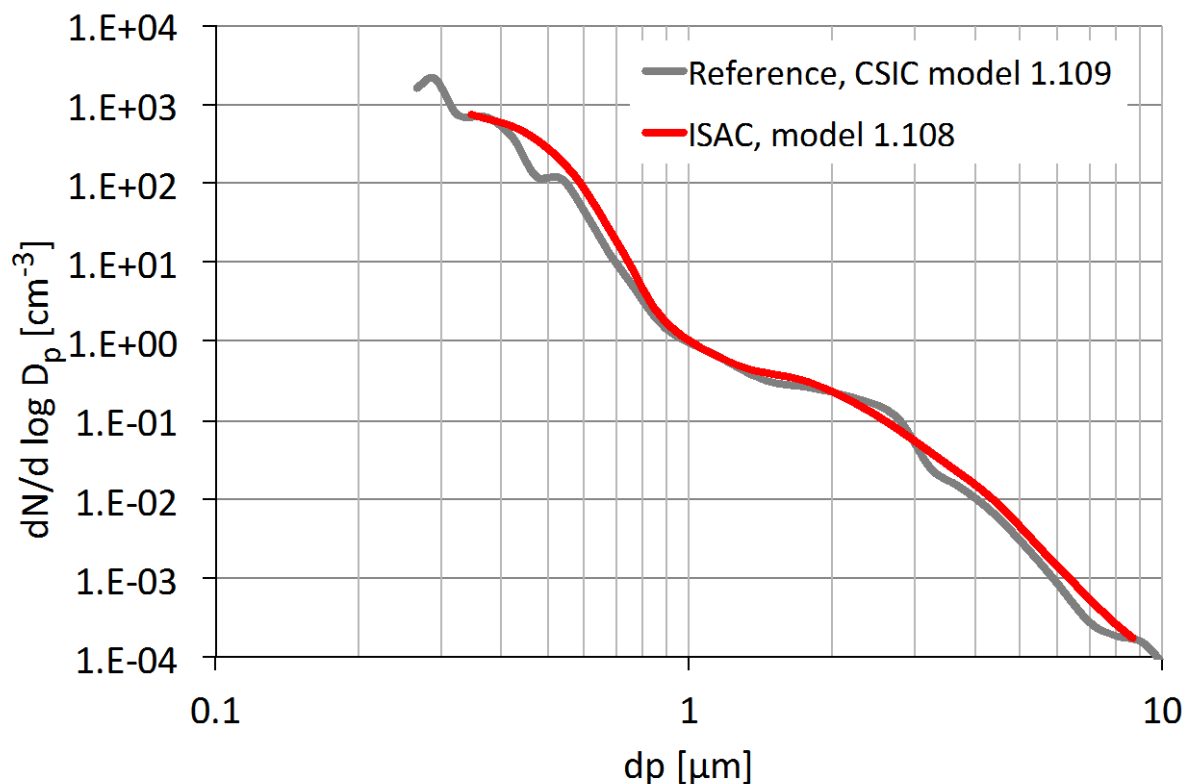


ISAC, Grimm1.108

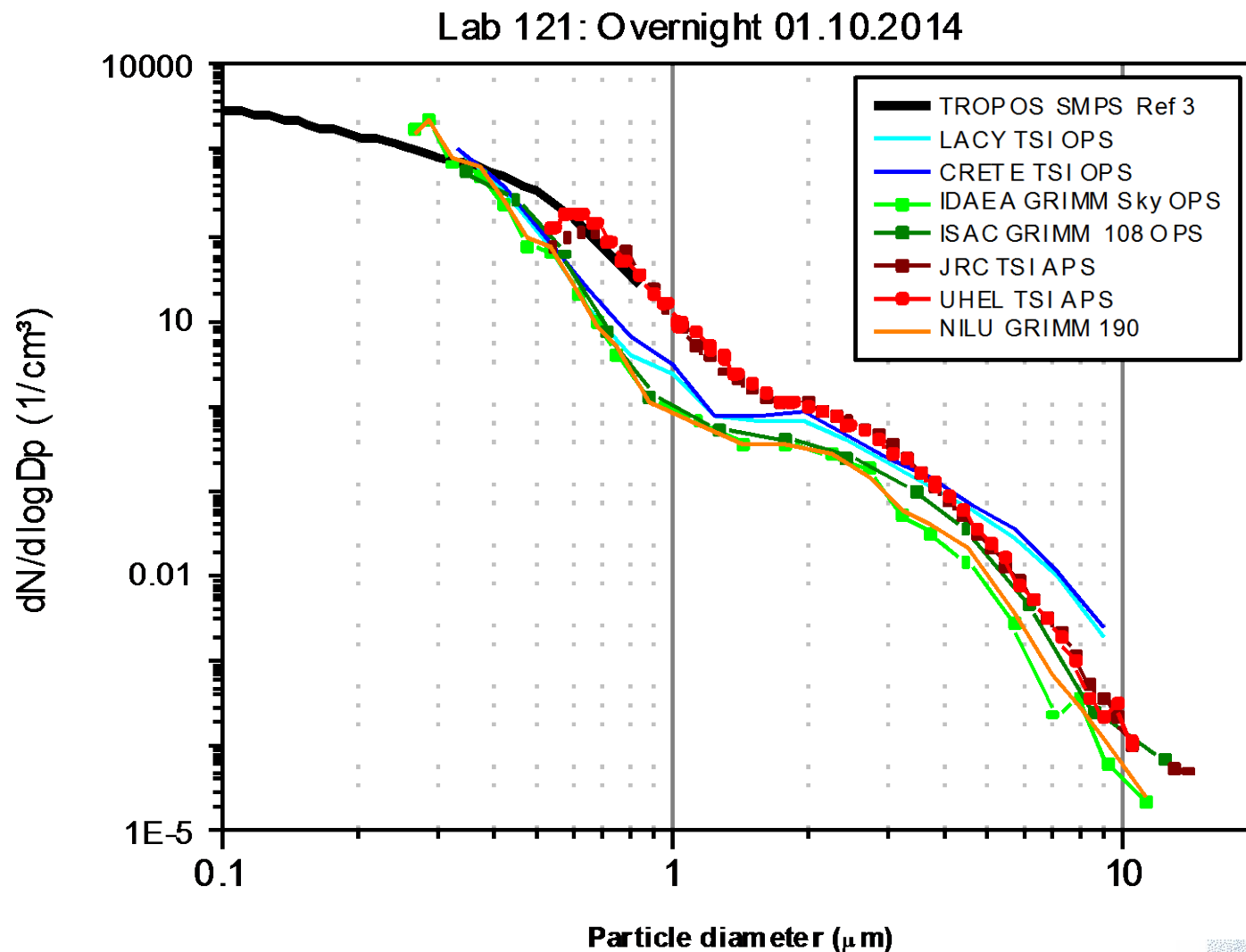
Instrument check:

- Device ok

Comparison to *workshop reference*:



Comparison of selected instruments



Summary of results & Outlook

- TSI size spectrometers were ok. One had to be cleaned because of a fuss.
- Many of Grimm OPSS had problems. These are mainly because of
 - dirty cells
 - untighten pumps. The pumps build in by Grimm are special modified pumps!
- Comparison of APSS and selected OPSS shows significant differences.

Acknowledgement

We thank TSI Incorporated and Grimm Aerosol Technik GmbH & Co. KG for their engagement.