Particle Metrix ZetaView Operating Training

2021 / 02 / 03

李佳玟

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Particle Metrix GmbH



PMX-120



PMX-220

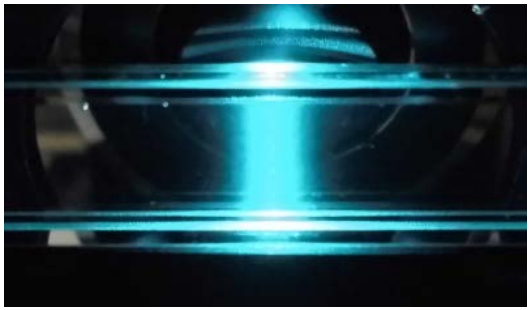


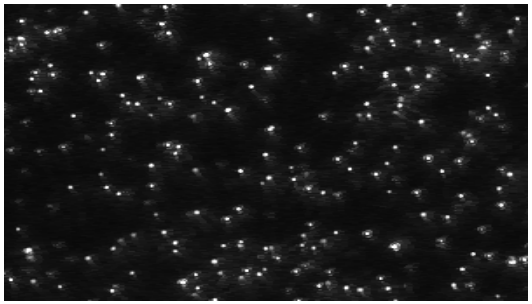
PMX-420

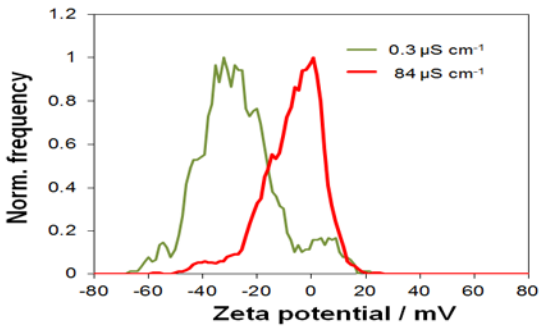


Particle Metrix GmbH 2004

Nanoparticle Tracking Analysis



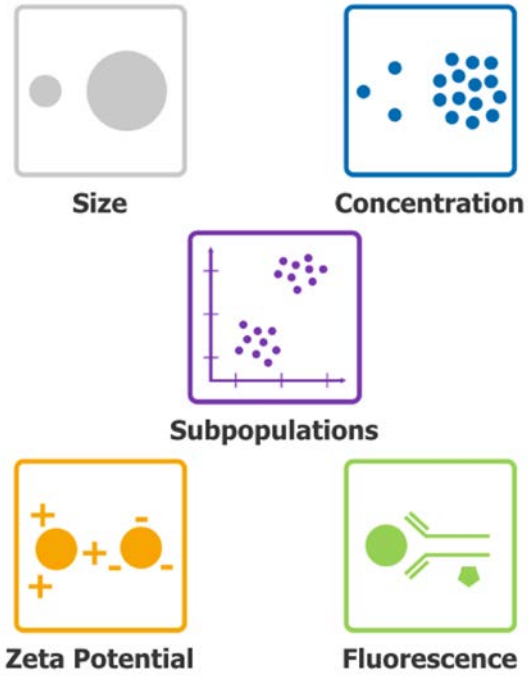




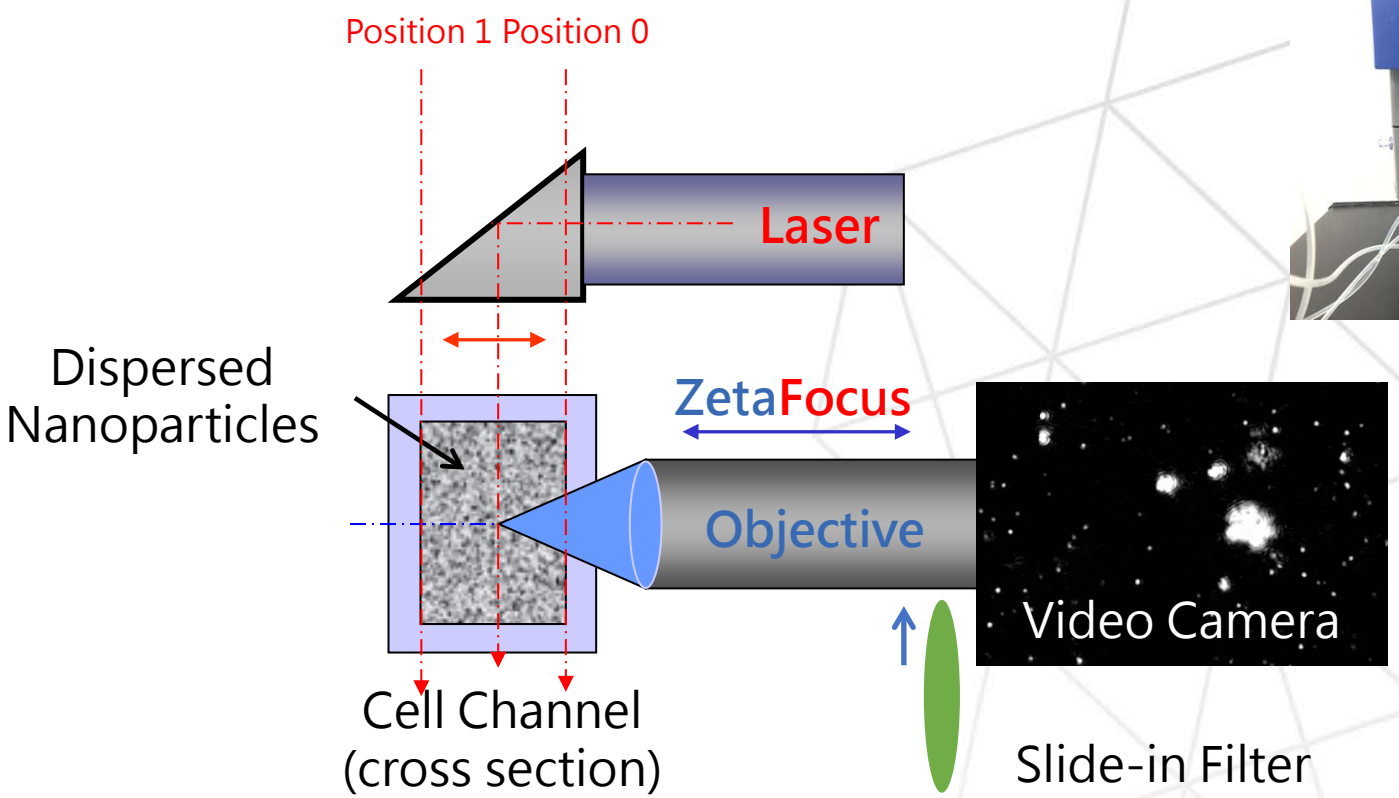
Injection

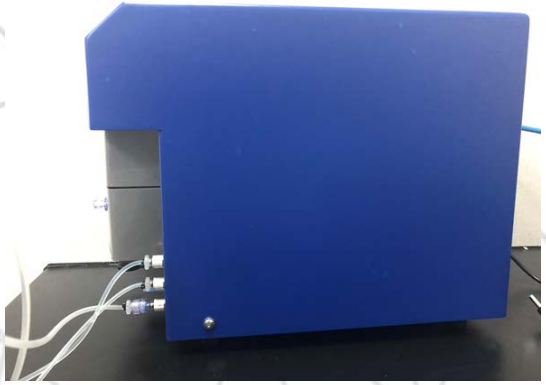
Visualization

Measurement



Nanoparticle Tracking Analysis - Setup

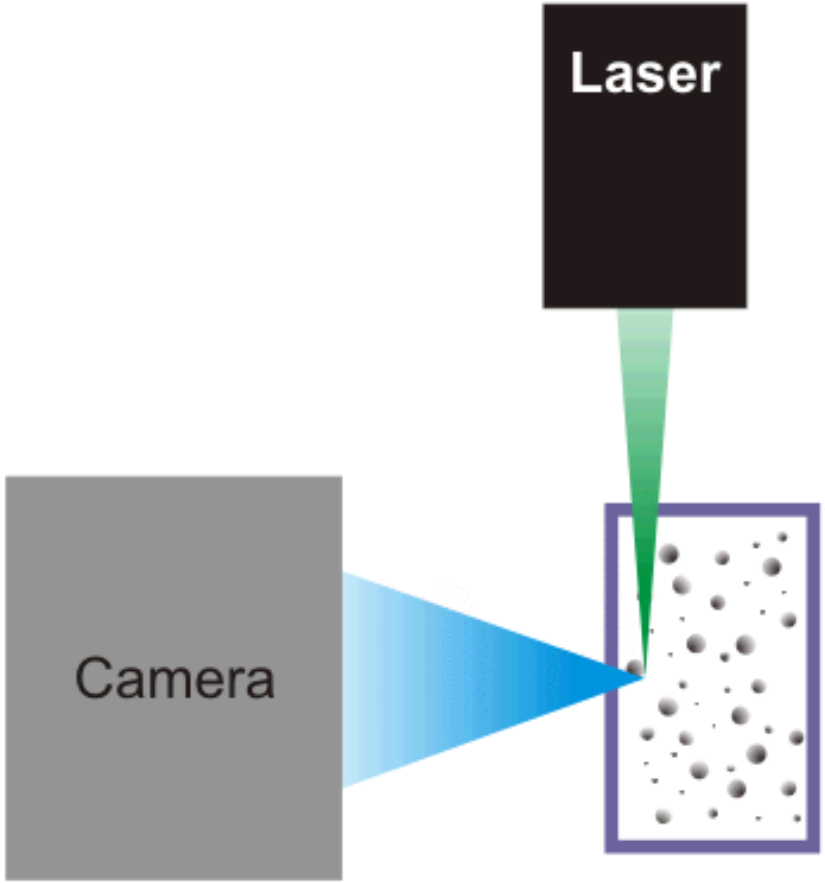




λ Laser / nm	Filter
405	420 LP
488	500 LP
520	550 LP
660	680 LP

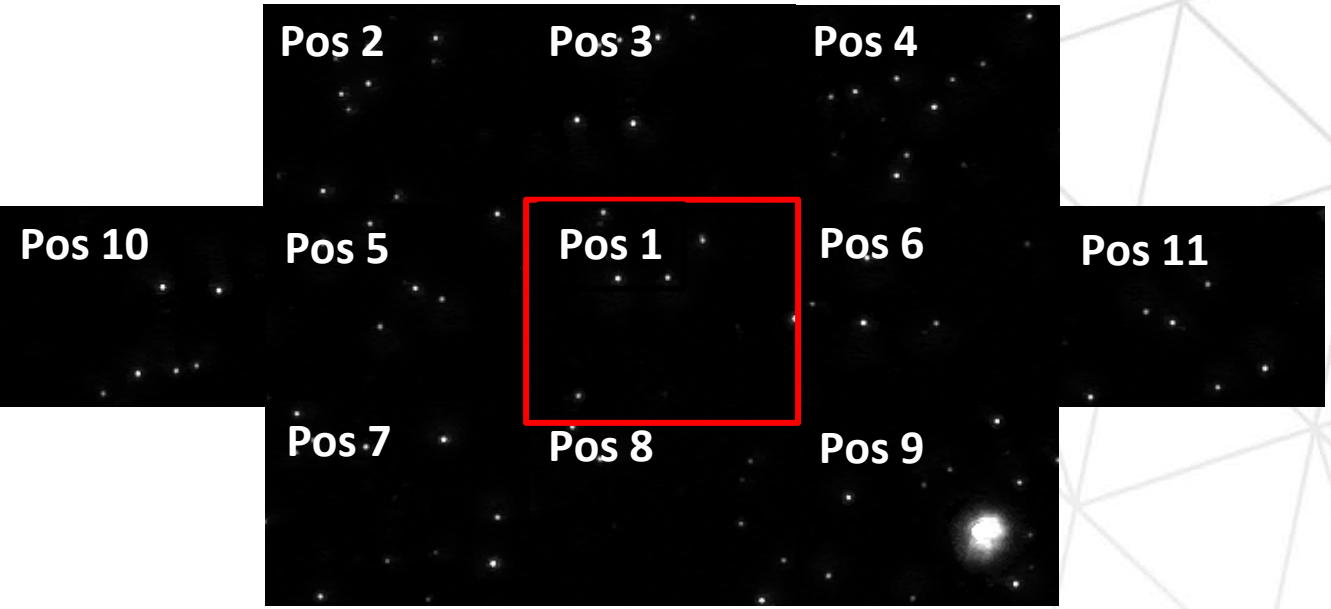
Available laser and filter wavelengths

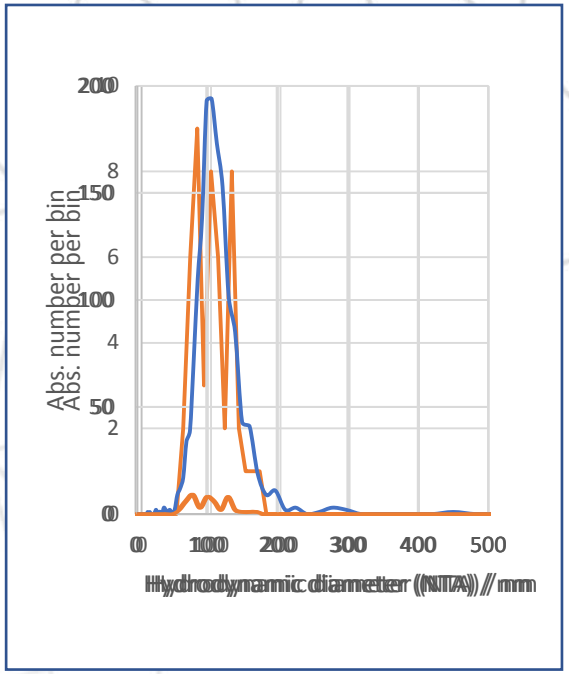
Unique Scanning technology



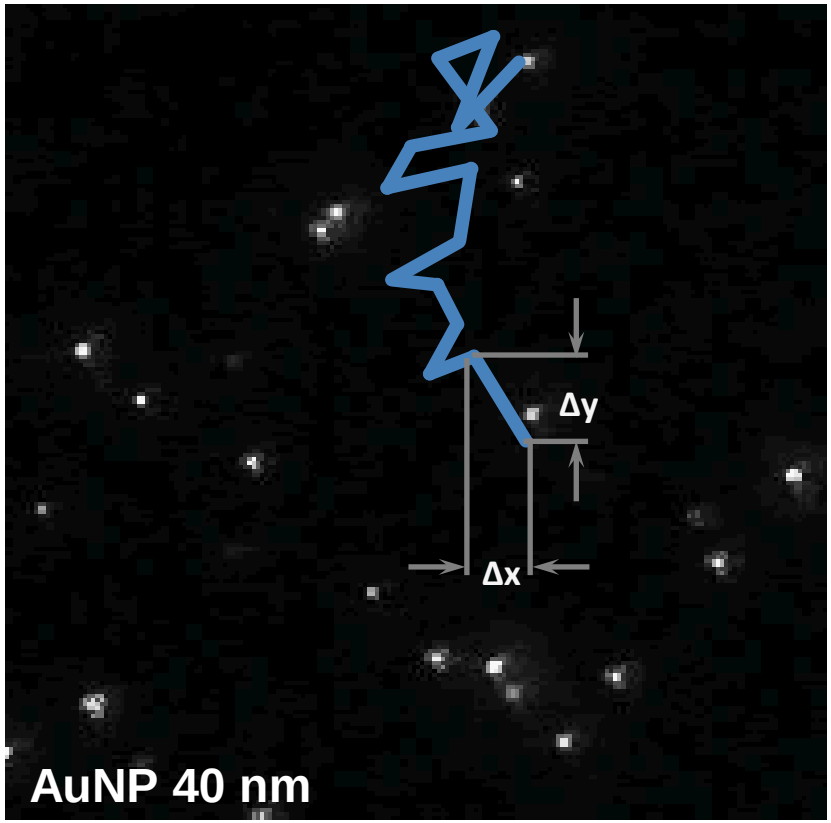
- Automated measurement of 11 positions per sample
- Representative sample result with high statistical power

Power of Statistics – Multiple Positions





Size Measurement- Brownian Motion



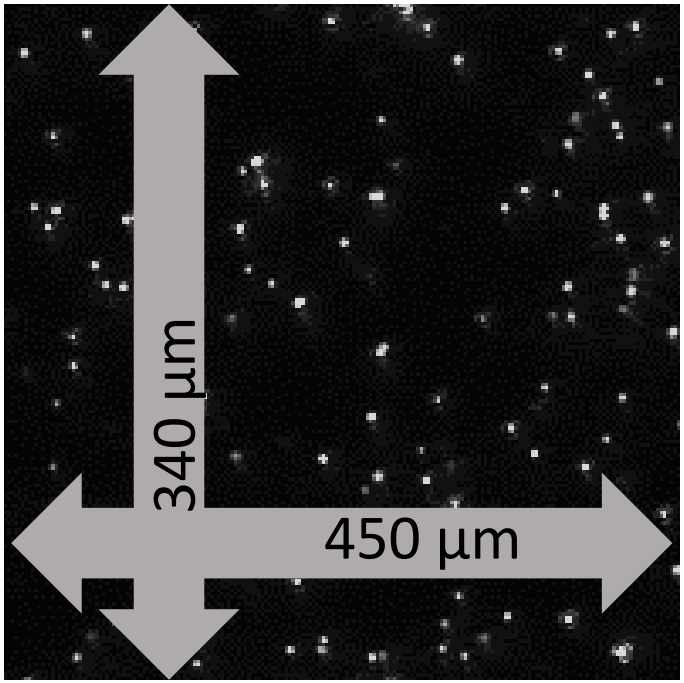
Stokes-Einstein

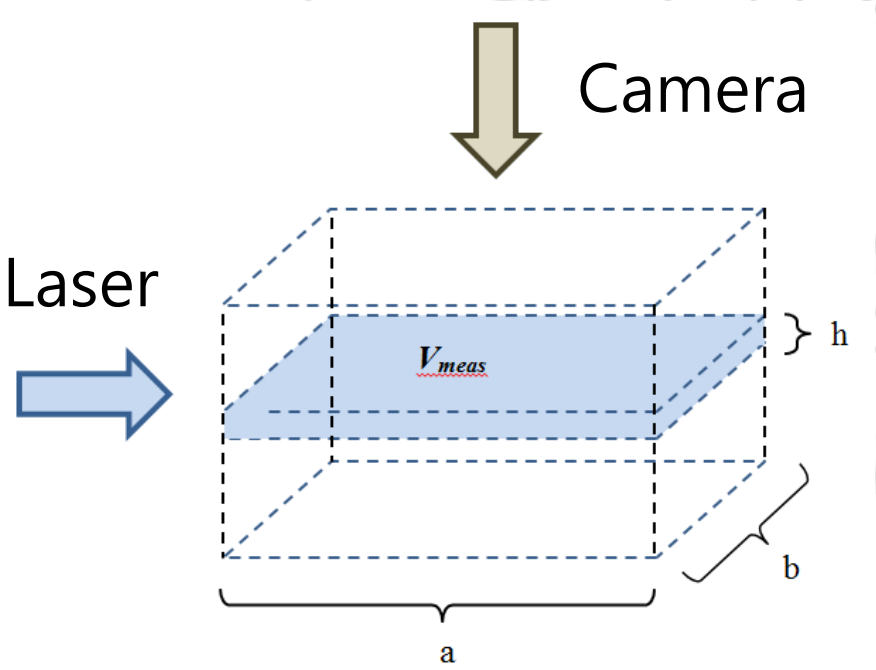
$$D = \frac{k_B T}{6\pi\eta r}$$

D = Diffusion coefficient [m^2/s]
k_B = Boltzmann constant
T = Temperature

η = Viscosity
r = Particle radius

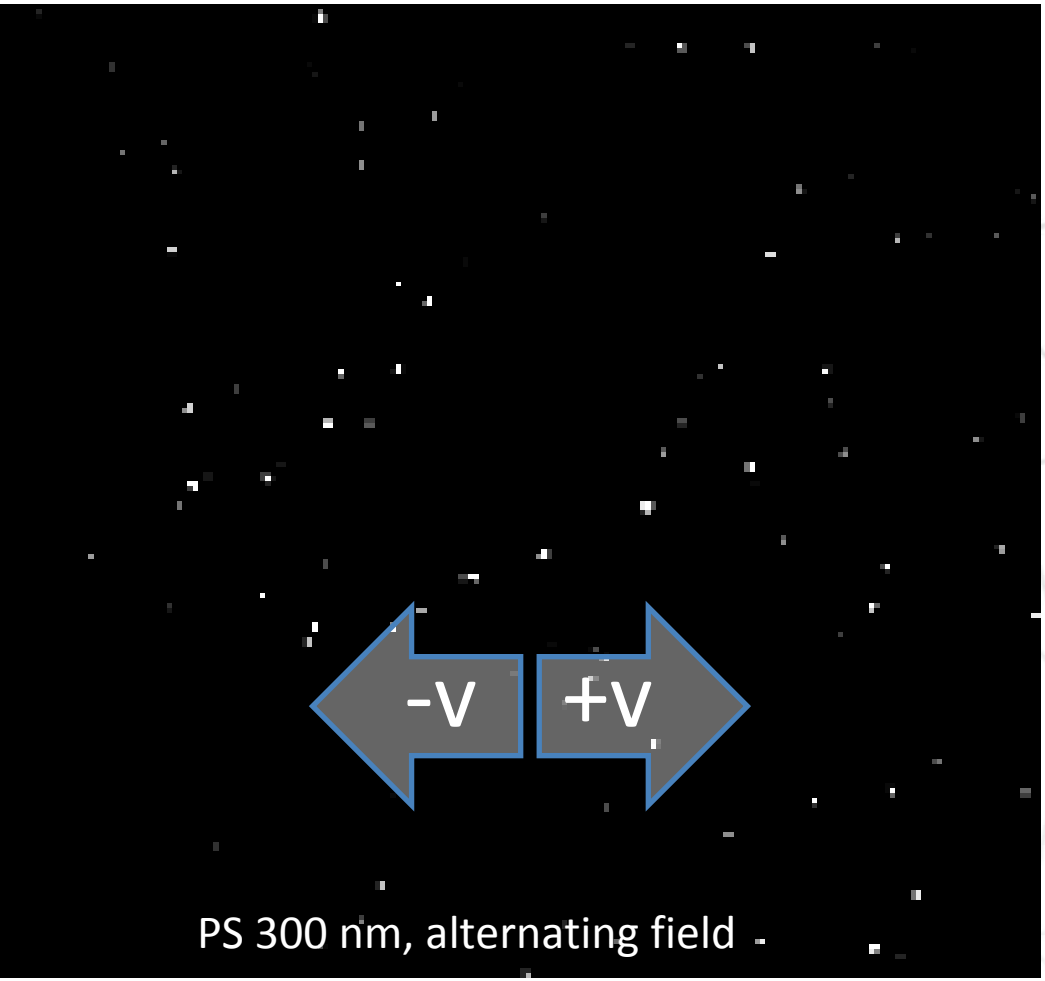
Concentration Measurement





Measurement volume: ~ 3nl/position

Zeta Potential Measurement



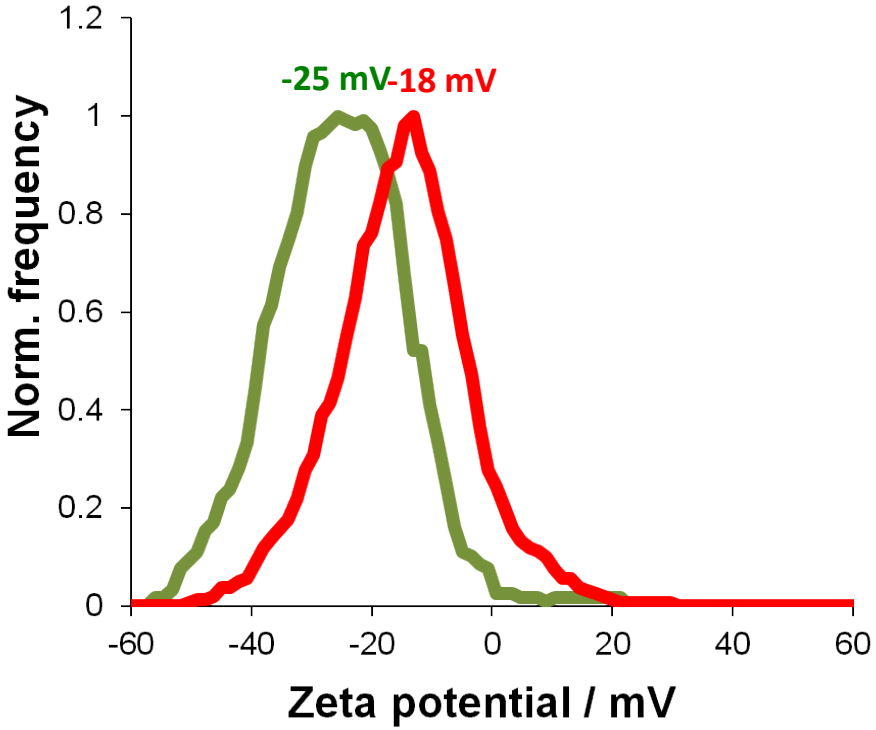
Helmholtz-Smoluchowski

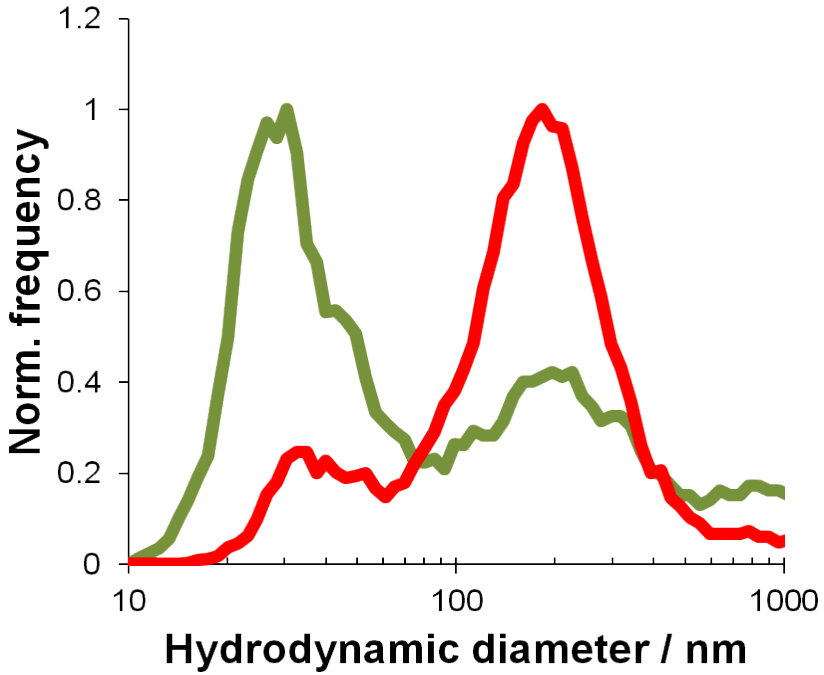
$$\zeta = \frac{4\pi\eta}{\varepsilon} f(\kappa a) \cdot \mu_e$$

ε = Dielectric constant
η = Viscosity of medium
$f(\kappa a)$ = Debye function

ζ = Zeta potential
μ_e=Electrophoretic mobility

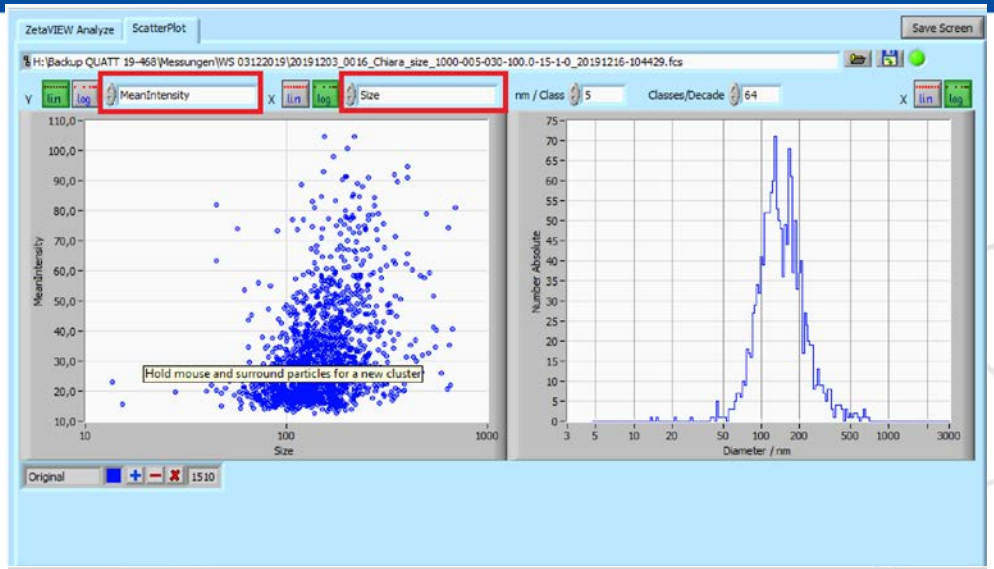
Zeta Potential Measurement

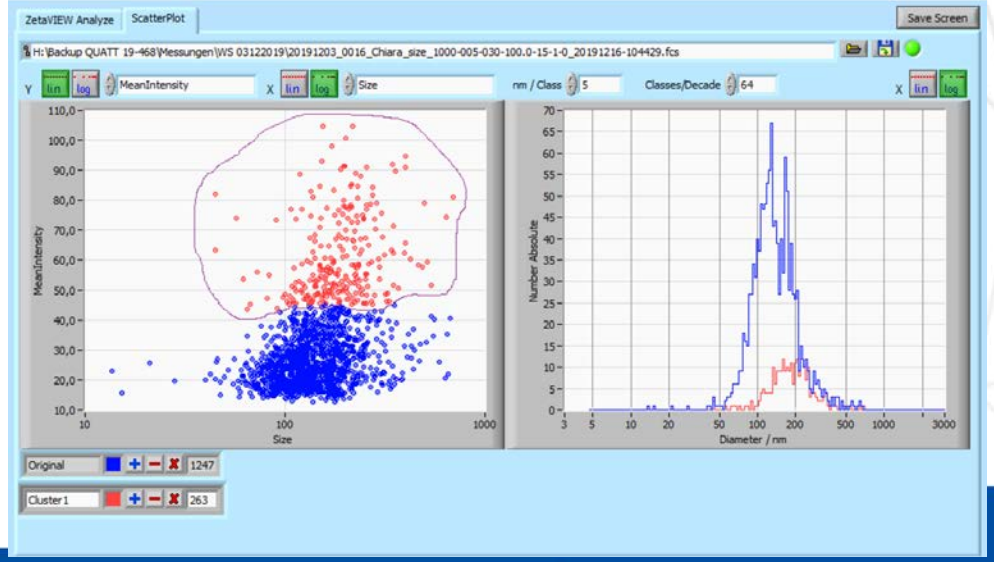




Zeta Potential is a quality criteria for your EV preparation

Resolution and Scatter plots





Multiple Variables

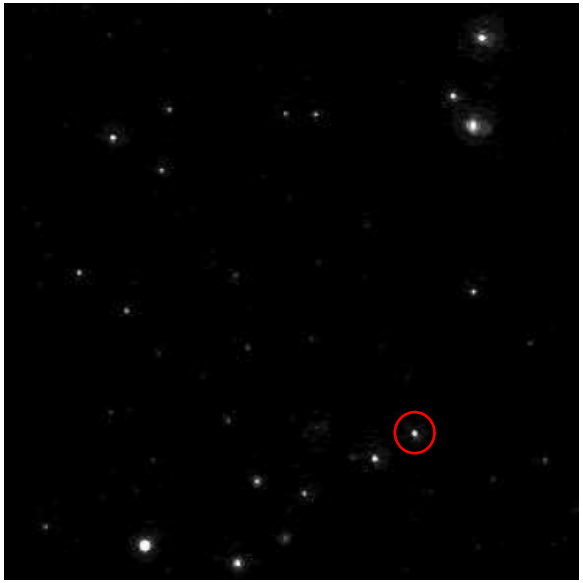
- Intensity
- Area
- Shape
- Trajectory data
- …

Typical applications of the ZetaView

- ✓ Bionanoparticles
- ✓ F-labeled bioNP
- ✓ Liposomes + Micelles
- ✓ Drug delivery
- ✓ Proteine agglomeration
- ✓ Virus like particles (VLP)
- ✓ Virus samples / Viral titer
- ✓ Extracellular vesicles (EV)
- ✓ Emulsions
- ✓ Polymers
- ✓ Nanometals
- ✓ Nanobubbles
- ✓ Irregular particles
- ✓ Quantum dots

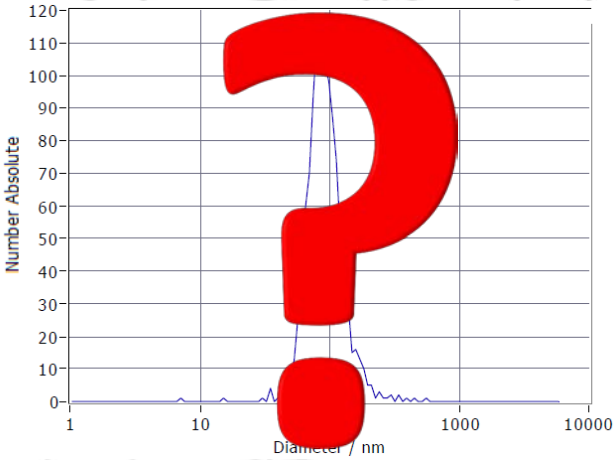
Fluorescence NTA (F-NTA)

Question
- Is my nanoparticle really an EV?
- Is my measurement correct using all particles?



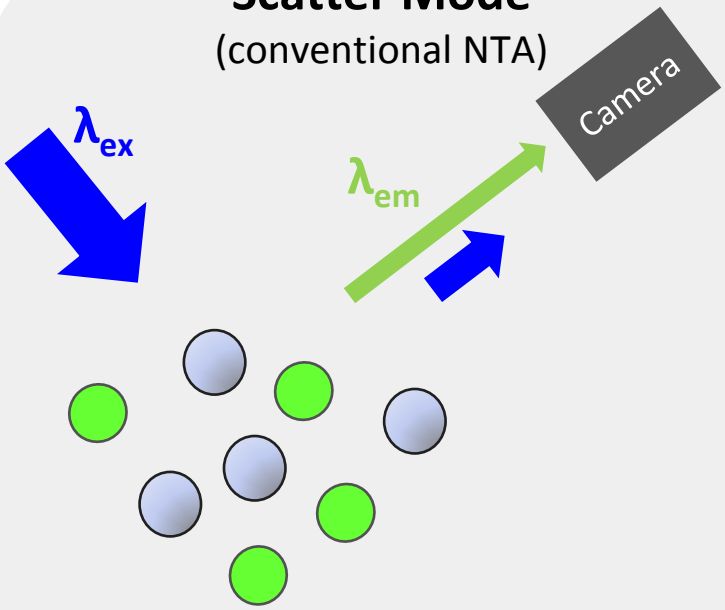
- **Exosome!**

- salt precipitate?
- protein aggregate?
- Nanobubble?
- …



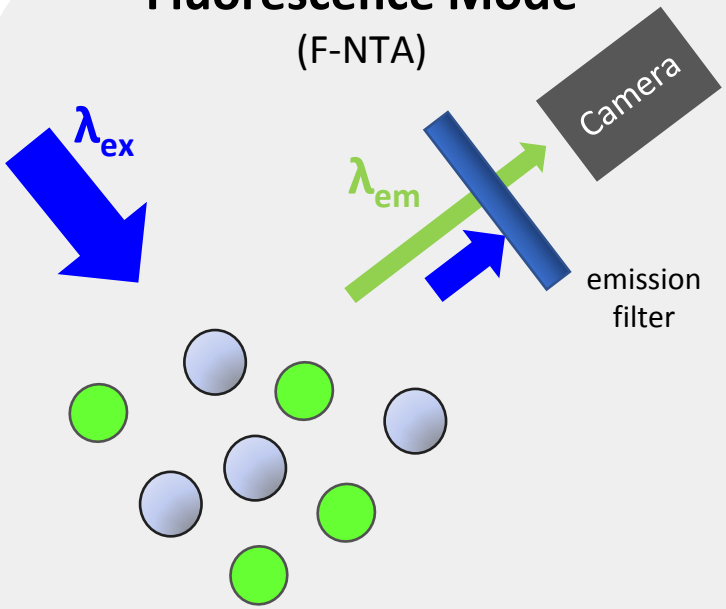
Fluorescence NTA (F-NTA)

Scatter Mode
(conventional NTA)



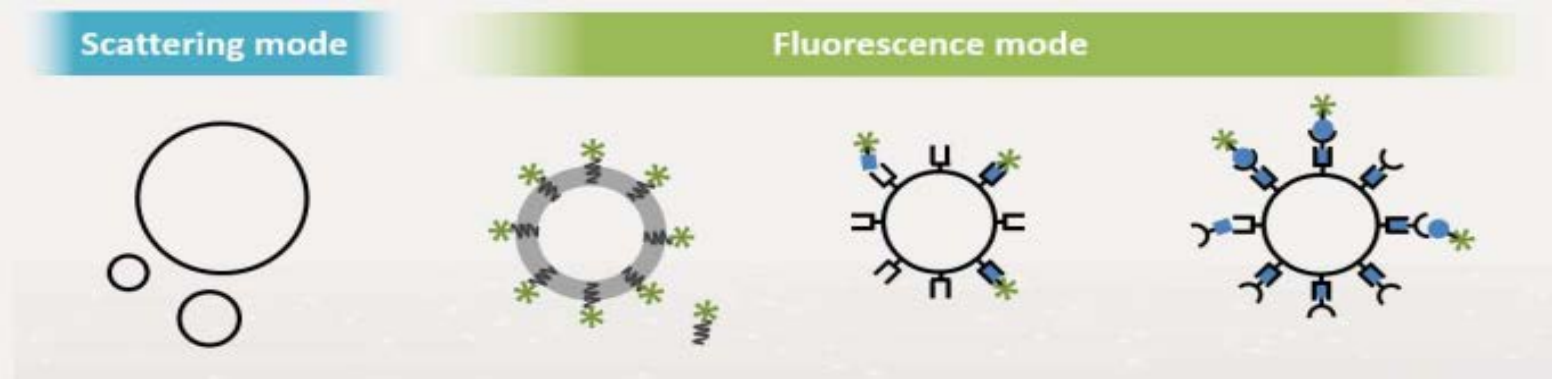
$C_{total,S} = C_S + C_F$

Fluorescence Mode
(F-NTA)



$C_{total,F} = C_F$

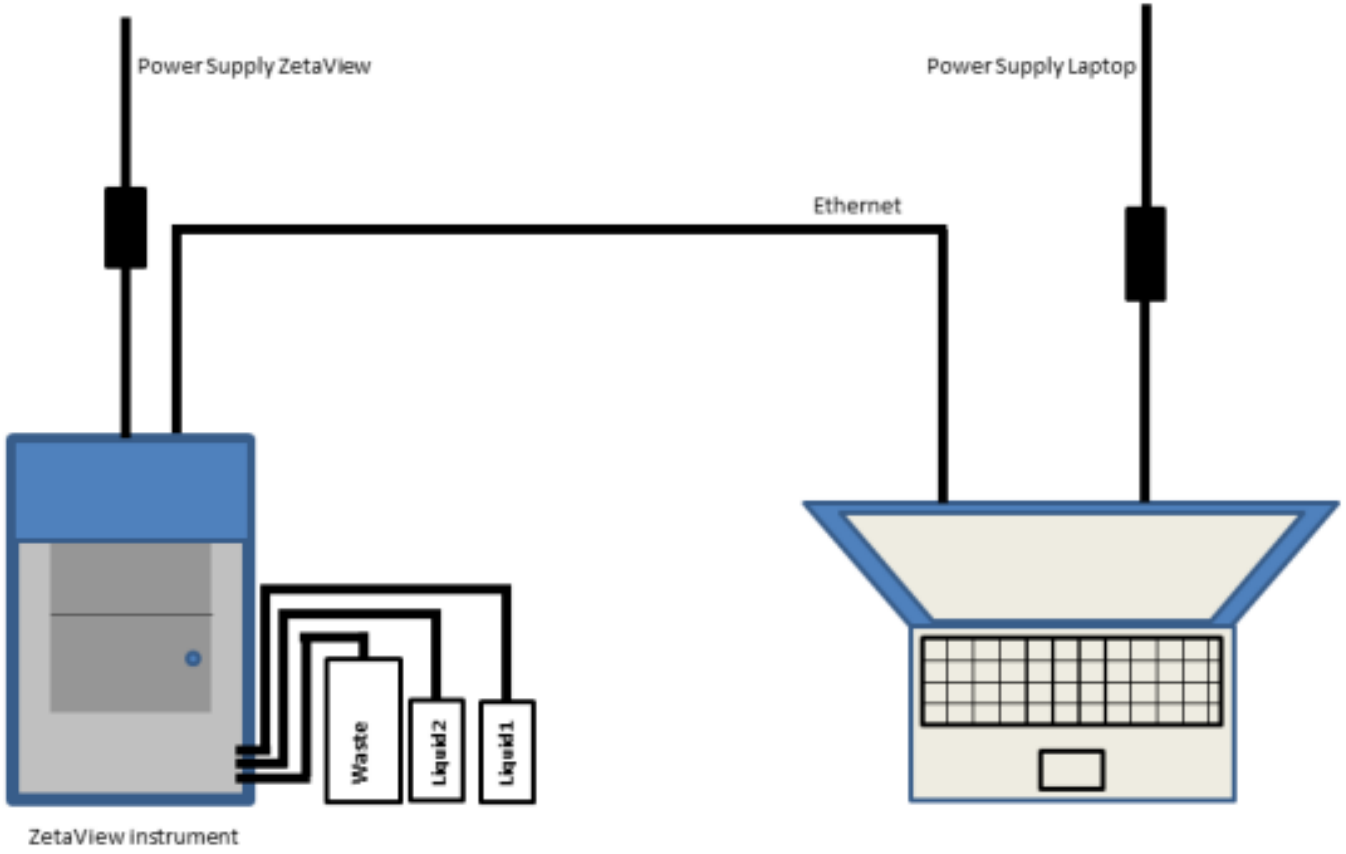
Application-F-NTA



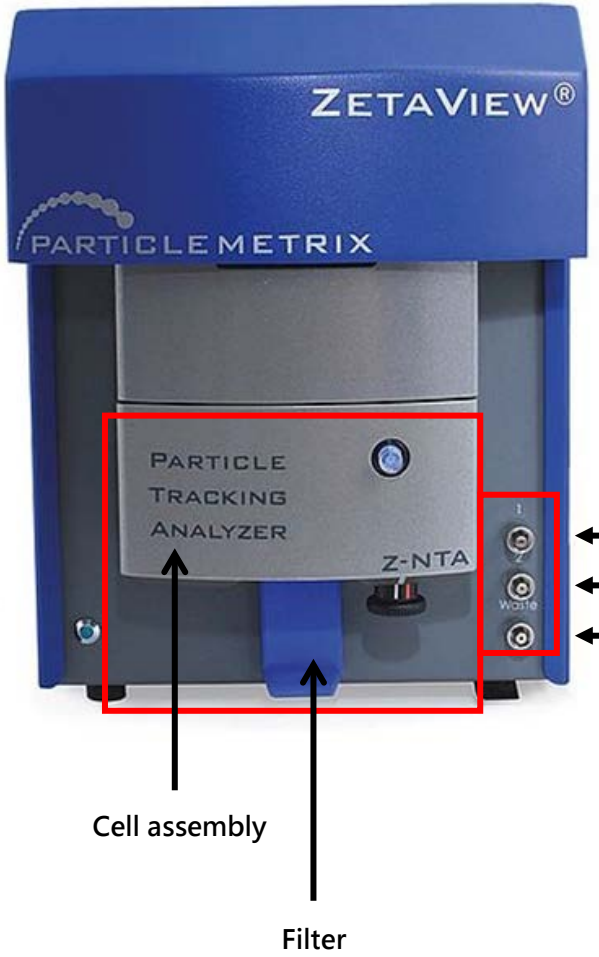
Particles	Membrane Dyes	Directly Labeled Antibodies	Secondary Antibodies
樣本 (labeled and unlabeled) 蛋白聚集、不可溶沉澱物氣泡、細胞碎屑等。	CMO / DiO / PHK67 / GFP等。	表面膜蛋白 (CD63 / 81 / 9等)	表面膜蛋白 (CD63 / 81 / 9等)，並透過二級抗體連結螢光訊號。
100%	Yield ~80 - 95%	0.001 - 95%	0.001 - 95%
計算樣本中所有顆粒。	計算螢光訊號，包含vesicles、membraneous particles。	含膜蛋白epitopes之particles。	含膜蛋白epitopes之particles。

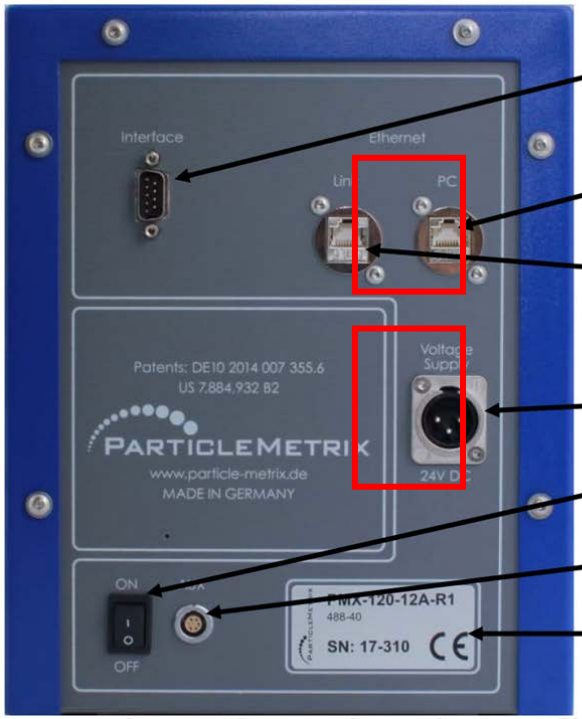
ZetaView Mono

Connection of the ZetaView® instrument

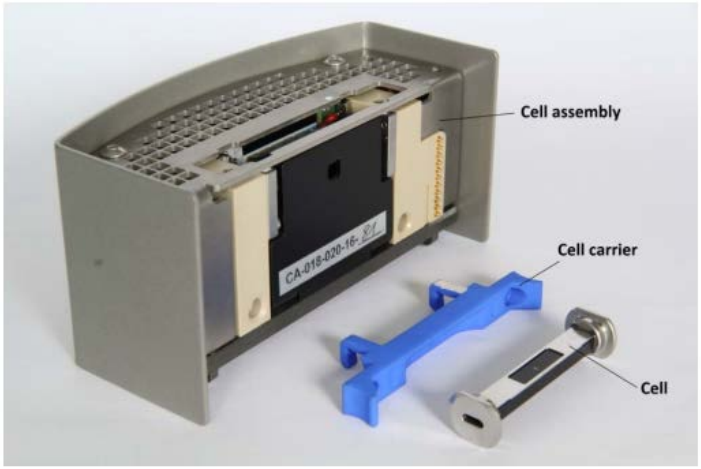


ZetaView® instrument

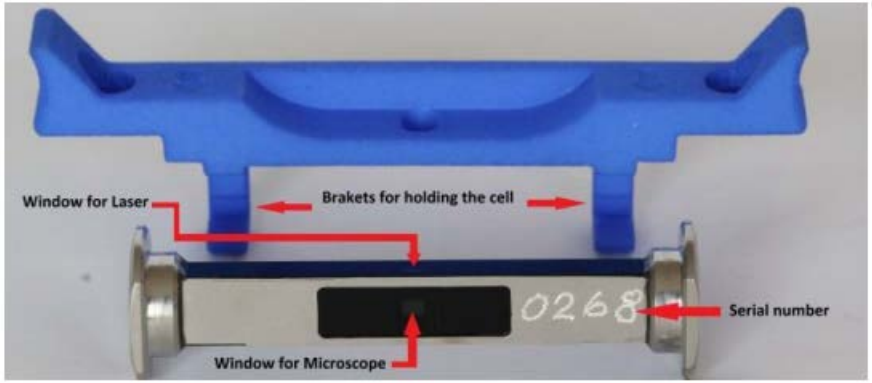




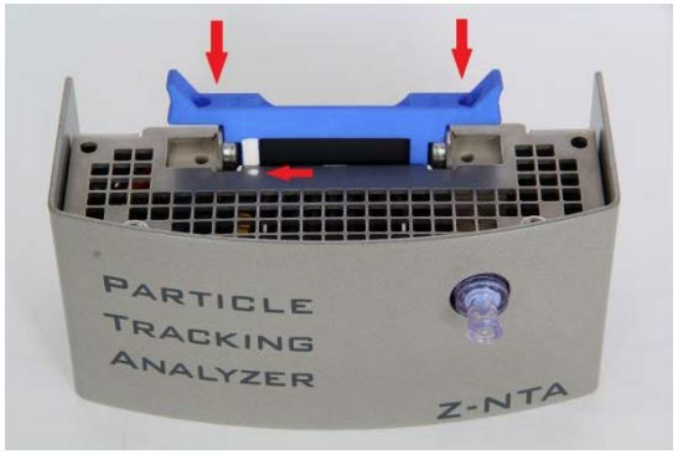
Cell Assembly



Cell Assembly



The correct orientation



Insertion



Fix the screws tightly.

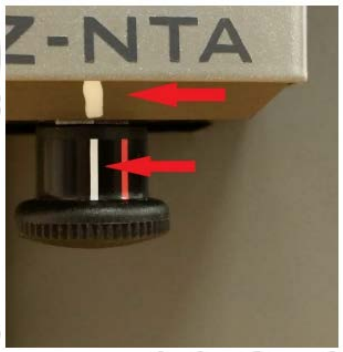
Mounting of the Cell Assembly



1. Unlock position



2. Push the Cell Assembly carefully



3. Locked position



4. Pushes and clicks in

Start-up Routine

Start-up Procedures

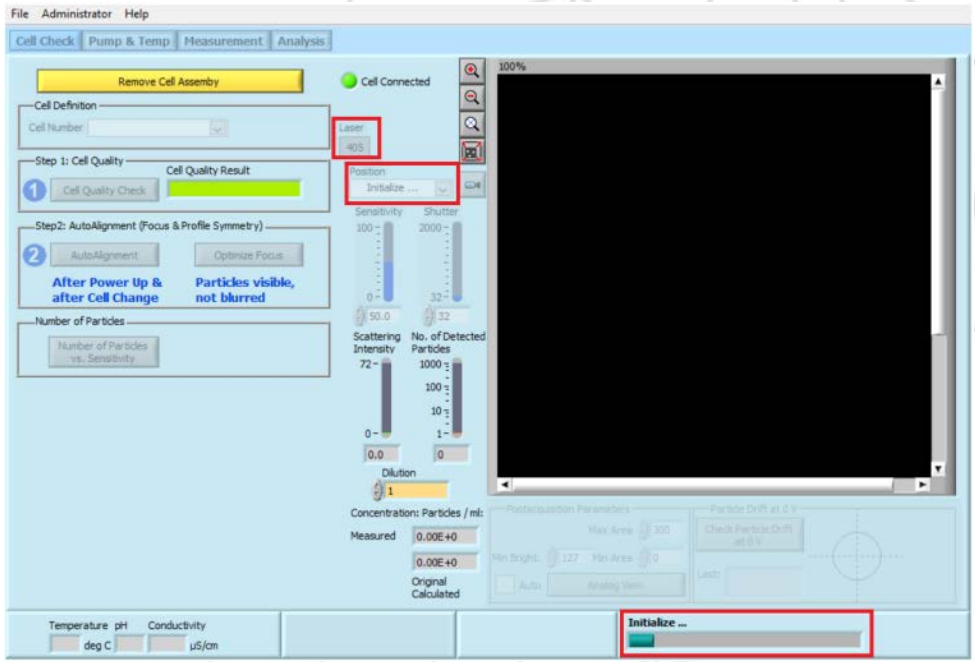
1. Power on



2. Start software

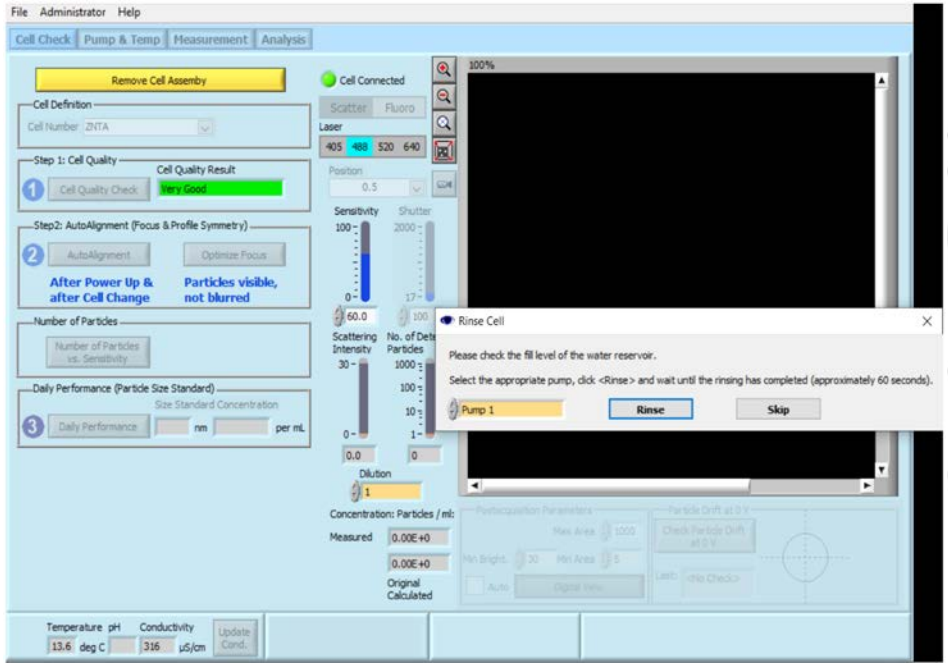


3. Initialize

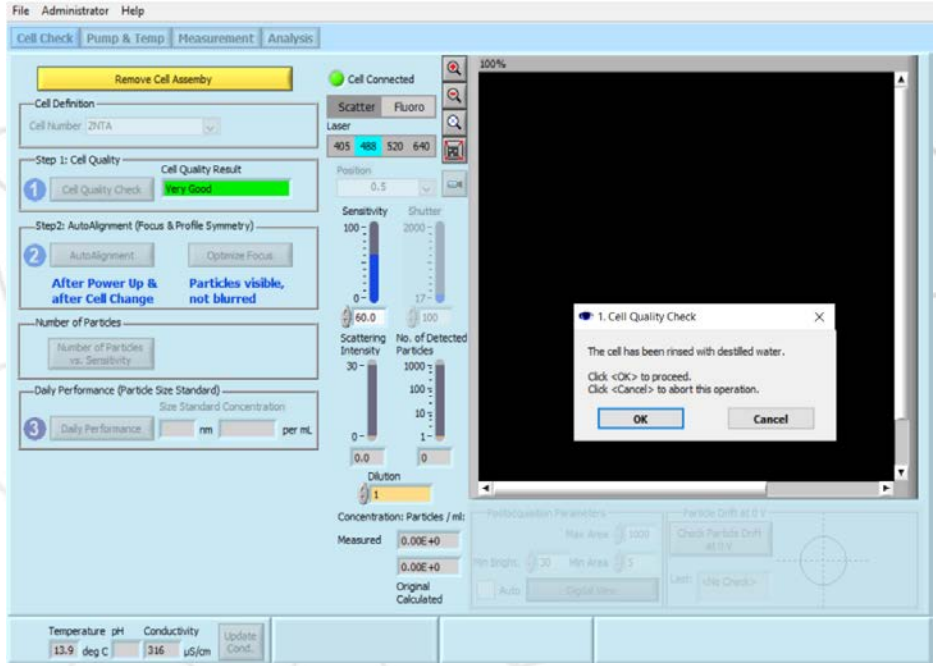


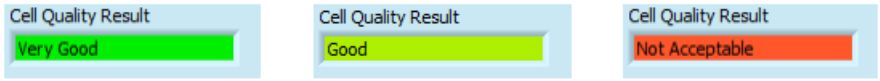
Start-up Procedures

4. Choose a pump



5. Cell quality check



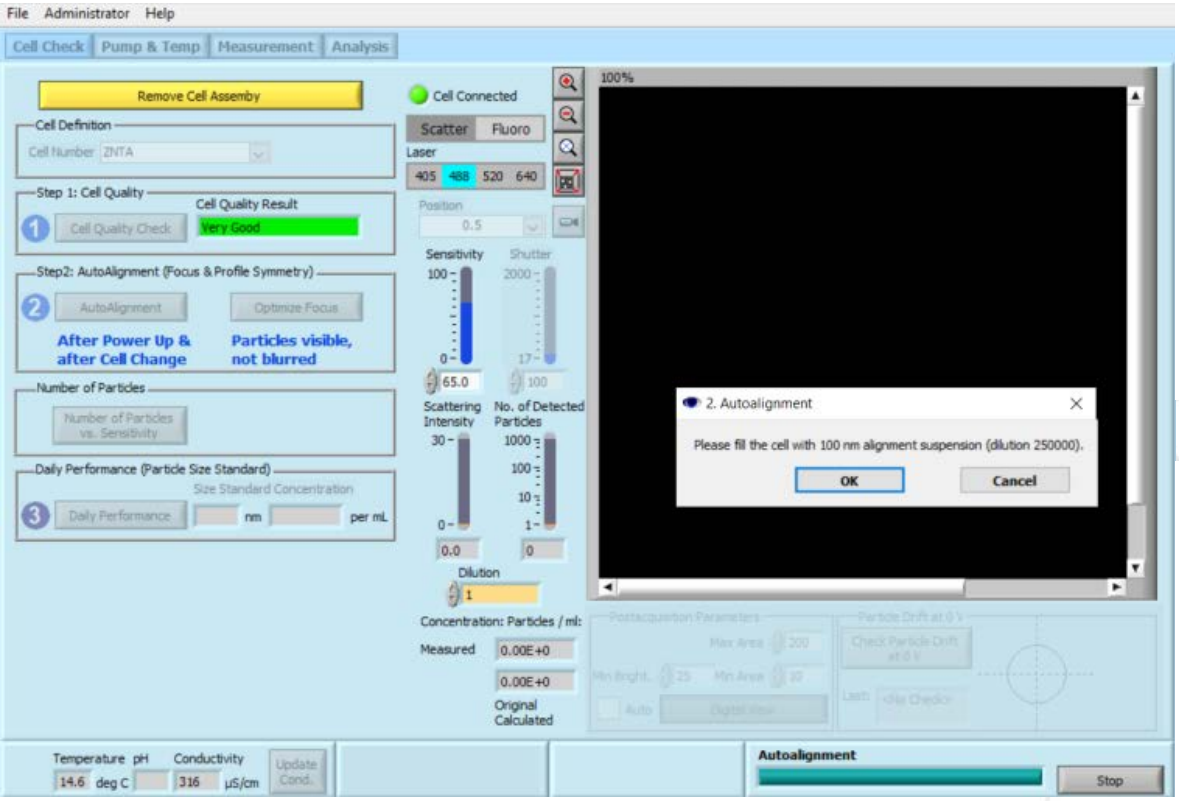


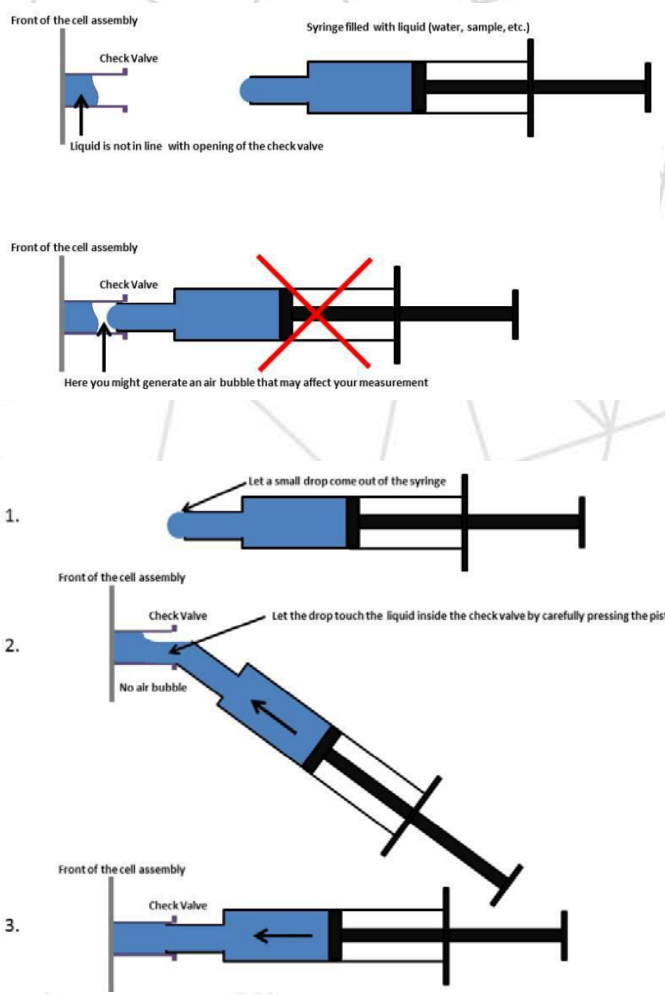
Cell quality results

Cell quality is not very good

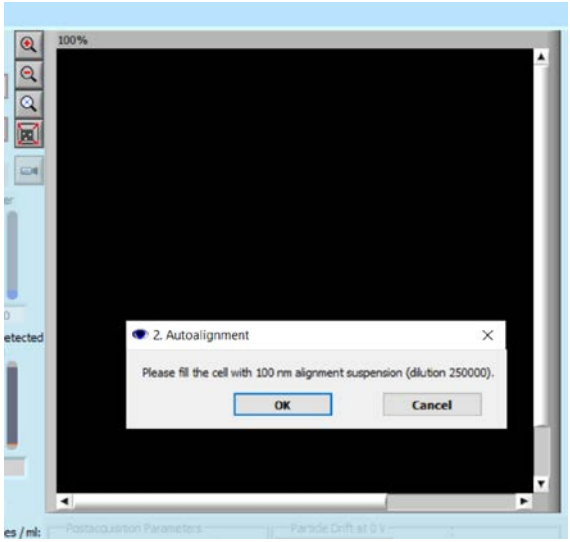
1. Too much particles
2. Air bubble
3. Need to clean the cell

Standard Beads and Injection

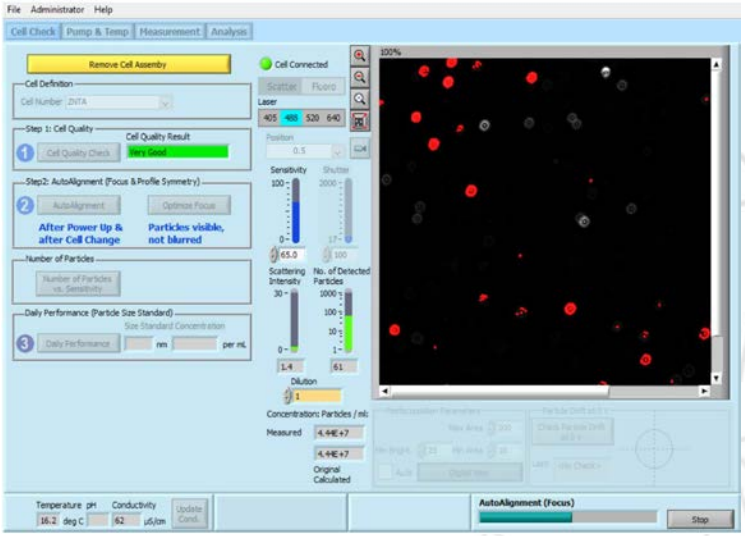




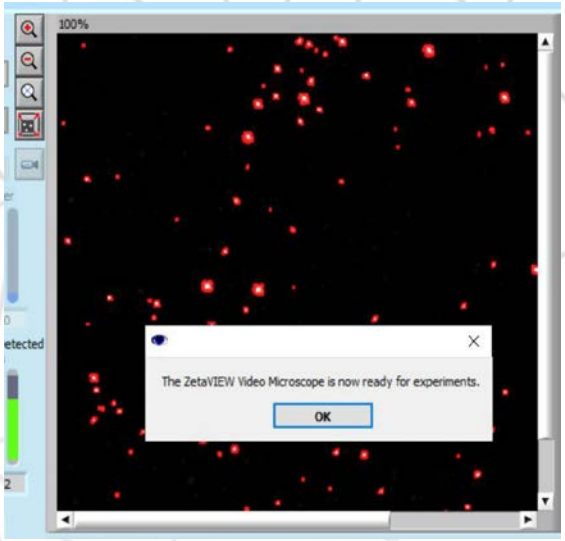
Autoalignment



Beads injection



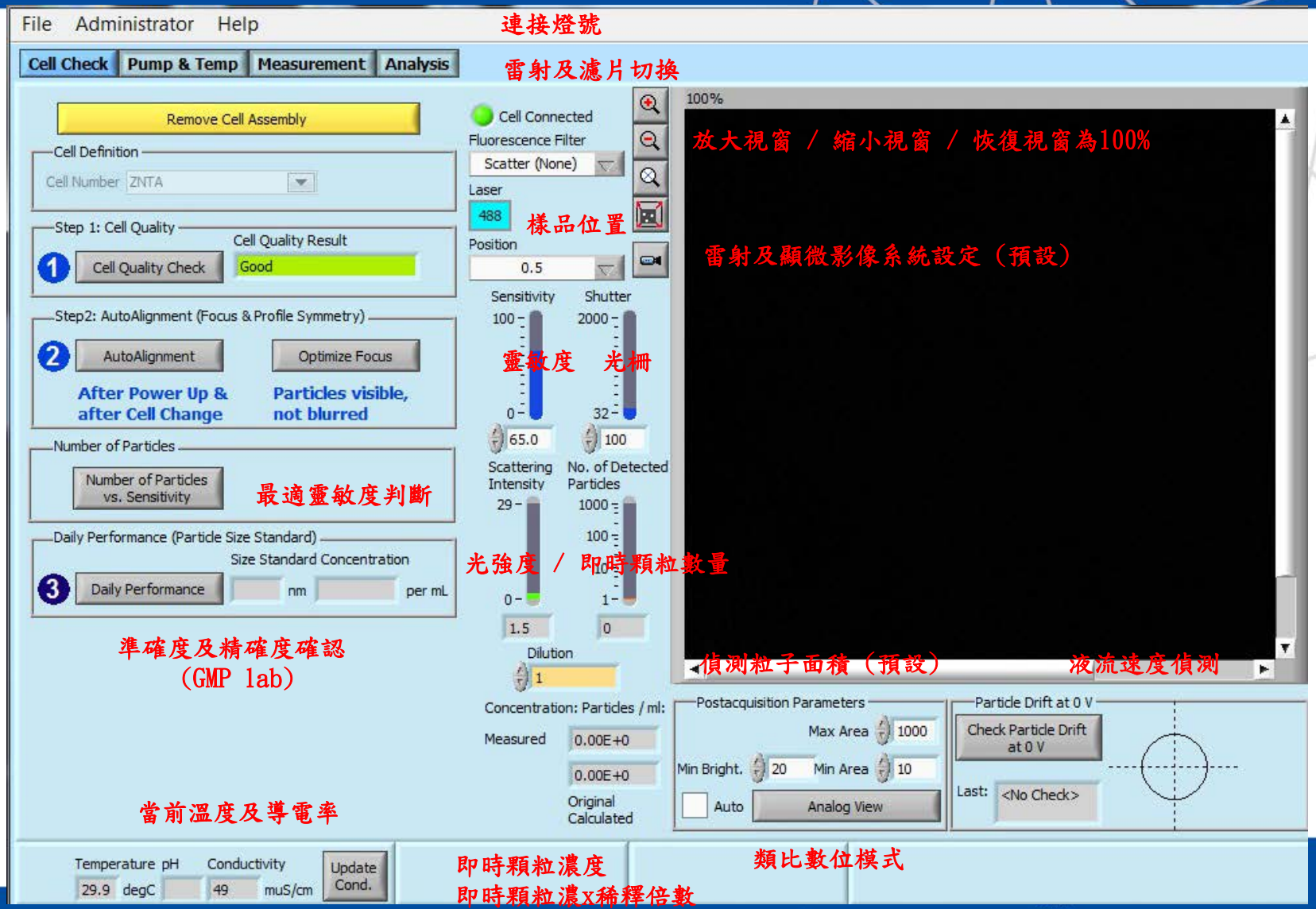
Autoalignment/Autofocus



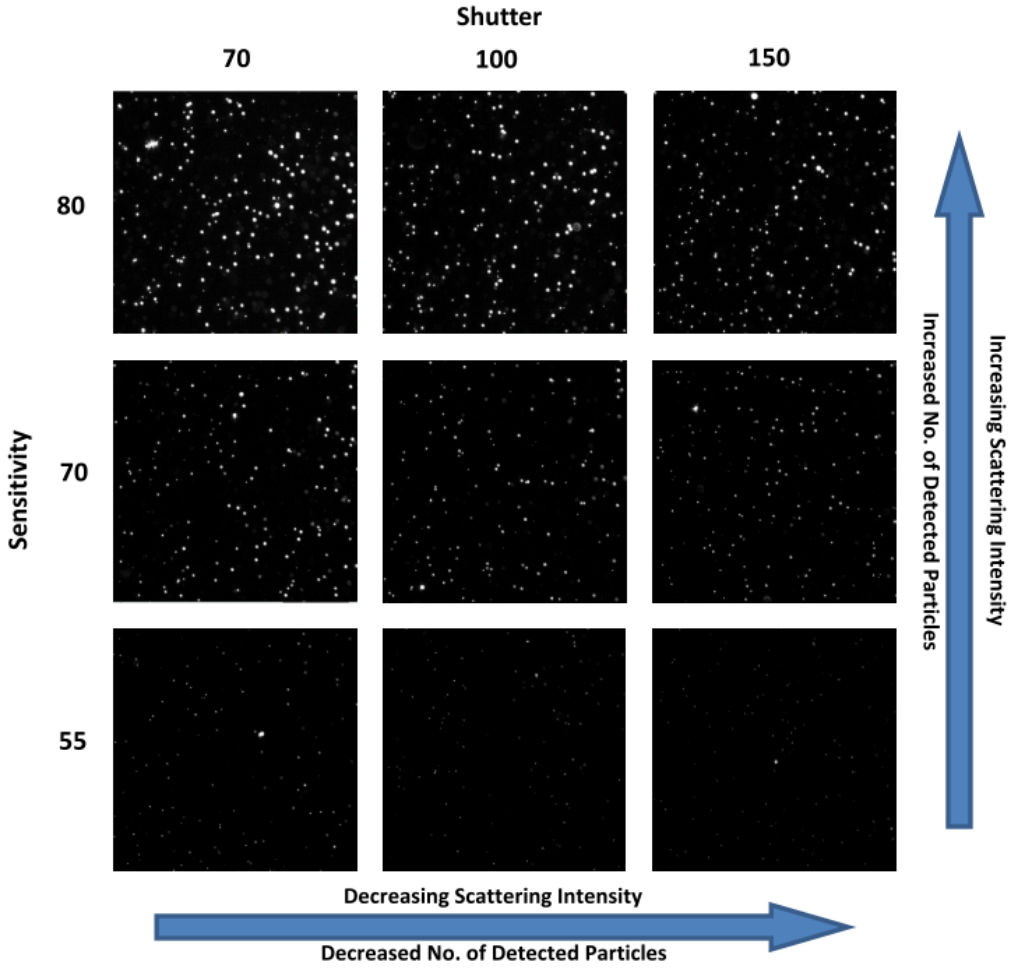
Ready for experiment

Measurements

Interface

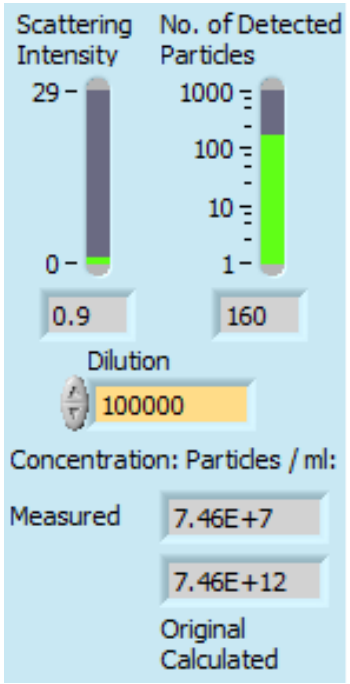

File
Administrator
Help
連接燈號
Cell Check
Pump & Temp
Measurement
Analysis
雷射及濾片切換
卸載樣品槽
Remove Cell Assembly
Cell Definition
Cell Number
ZNTA
偵測樣品槽
Step 1: Cell Quality
Cell Quality Check
Cell Quality Result
Good
執行自動校正/對焦
Step2: AutoAlignment (Focus & Profile Symmetry)
AutoAlignment
Optimize Focus
After Power Up & after Cell Change
Particles visible, not blurred
Number of Particles
Number of Particles vs. Sensitivity
最適靈敏度判斷
Daily Performance (Particle Size Standard)
Size Standard Concentration
Daily Performance
nm
per mL
準確度及精確度確認
(GMP lab)
Cell Connected
Fluorescence Filter
Scatter (None)
Laser
488
樣品位置
Position
0.5
Sensitivity
Shutter
靈敏度
光柵
65.0
100
Scattering Intensity
No. of Detected Particles
光強度 / 即時顆粒數量
Dilution
1
Concentration: Particles / ml:
Measured
0.00E+0
0.00E+0
Original
Calculated
100%
放大視窗 / 縮小視窗 / 恢復視窗為100%
雷射及顯微影像系統設定（預設）
偵測粒子面積（預設）
液流速度偵測
Postacquisition Parameters
Max Area
1000
Min Bright.
20
Min Area
10
Auto
Analog View
Particle Drift at 0 V
Check Particle Drift at 0 V
Last:
<No Check>
當前溫度及導電率
Temperature
pH
Conductivity
29.9
degC
49
muS/cm
Update Cond.
即時顆粒濃度
即時顆粒濃x稀釋倍數
類比數位模式

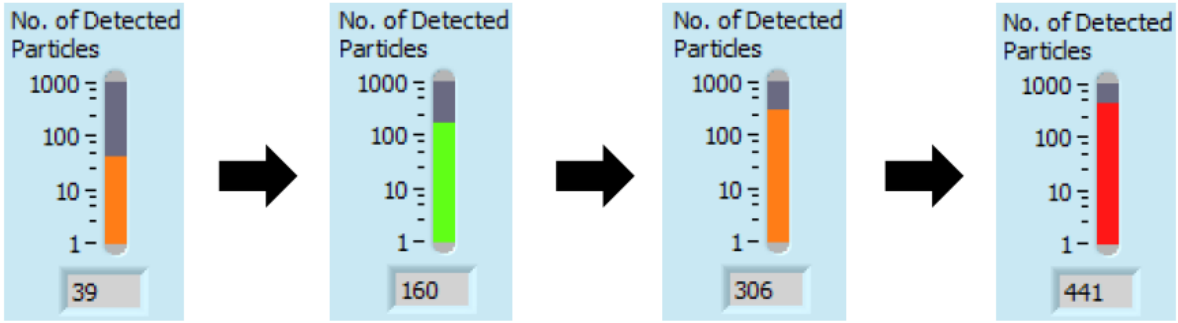
Interplay of Sensitivity, Shutter, Scattering Intensity and No. of Detected Particles



標準珠 S65 F80
EVs S75 F90

No. of Detected Particles and the Measured Concentration





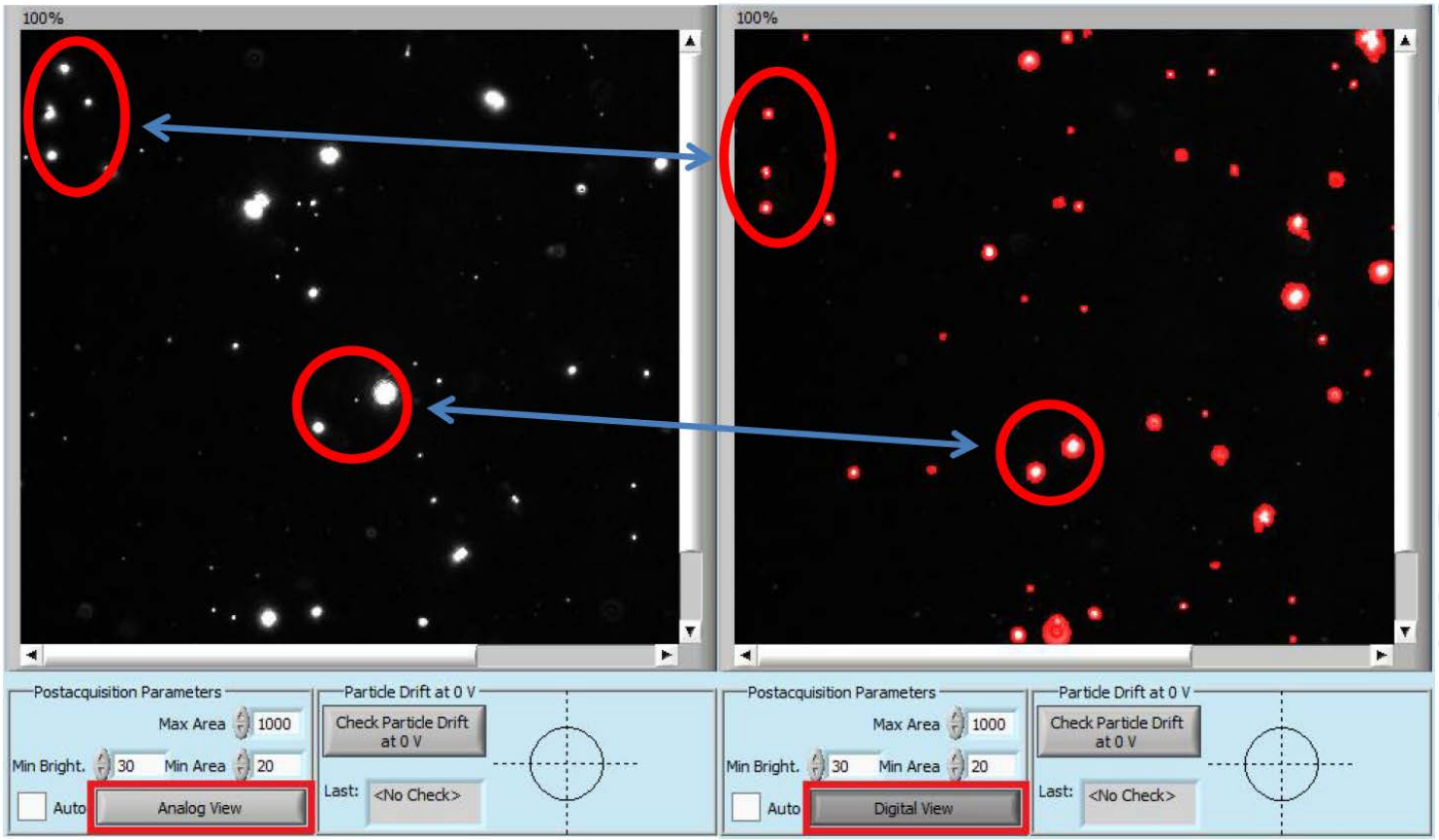
1-49 particles

50-200 particles

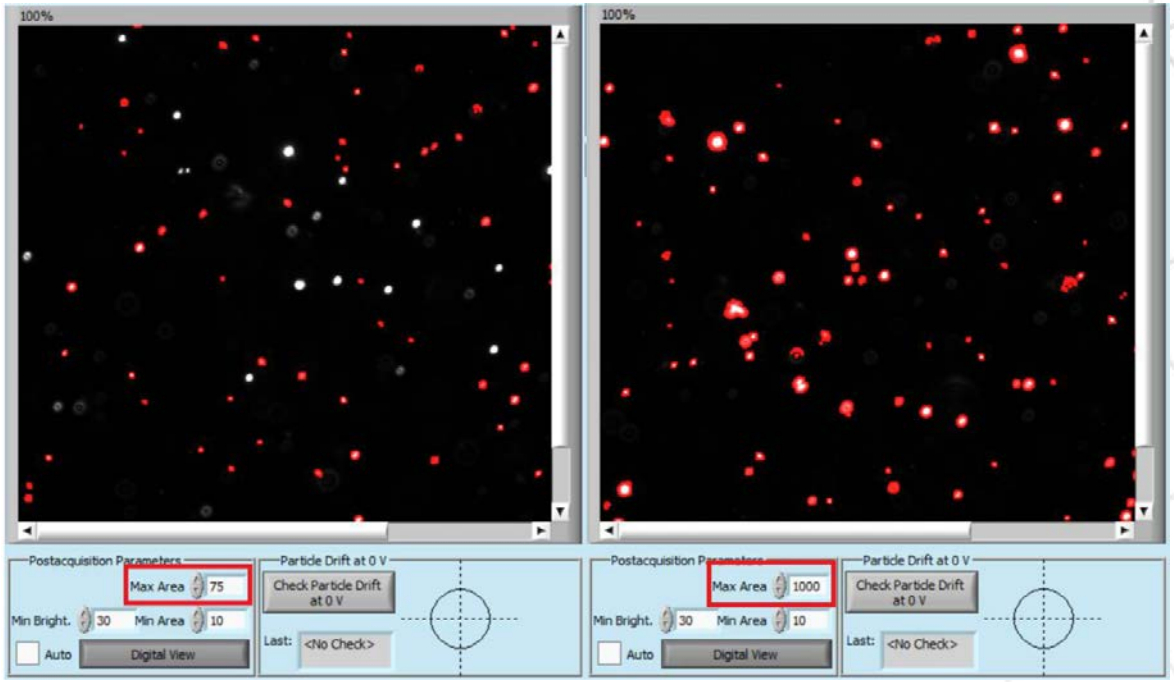
201-400 particles

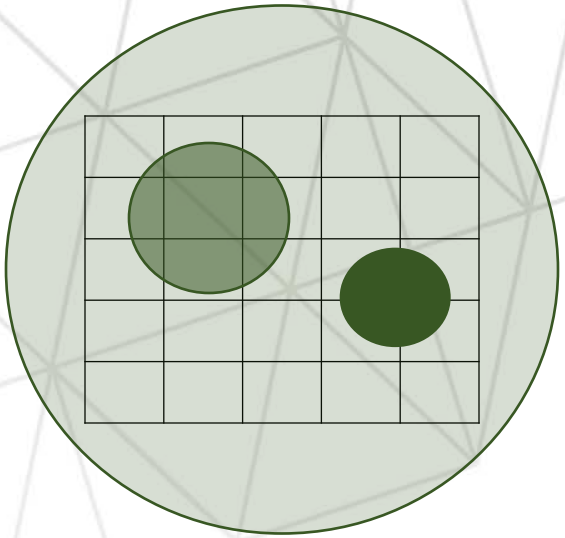
>400 particles

Analog and Digital View



Max. and Min. Area





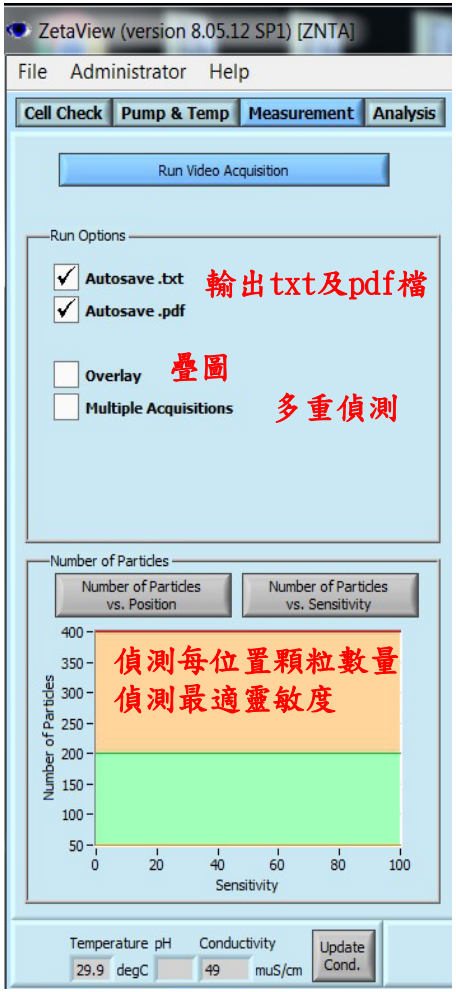
3 sizes of particles in 25 pixels, assuming max 25, mini 4.

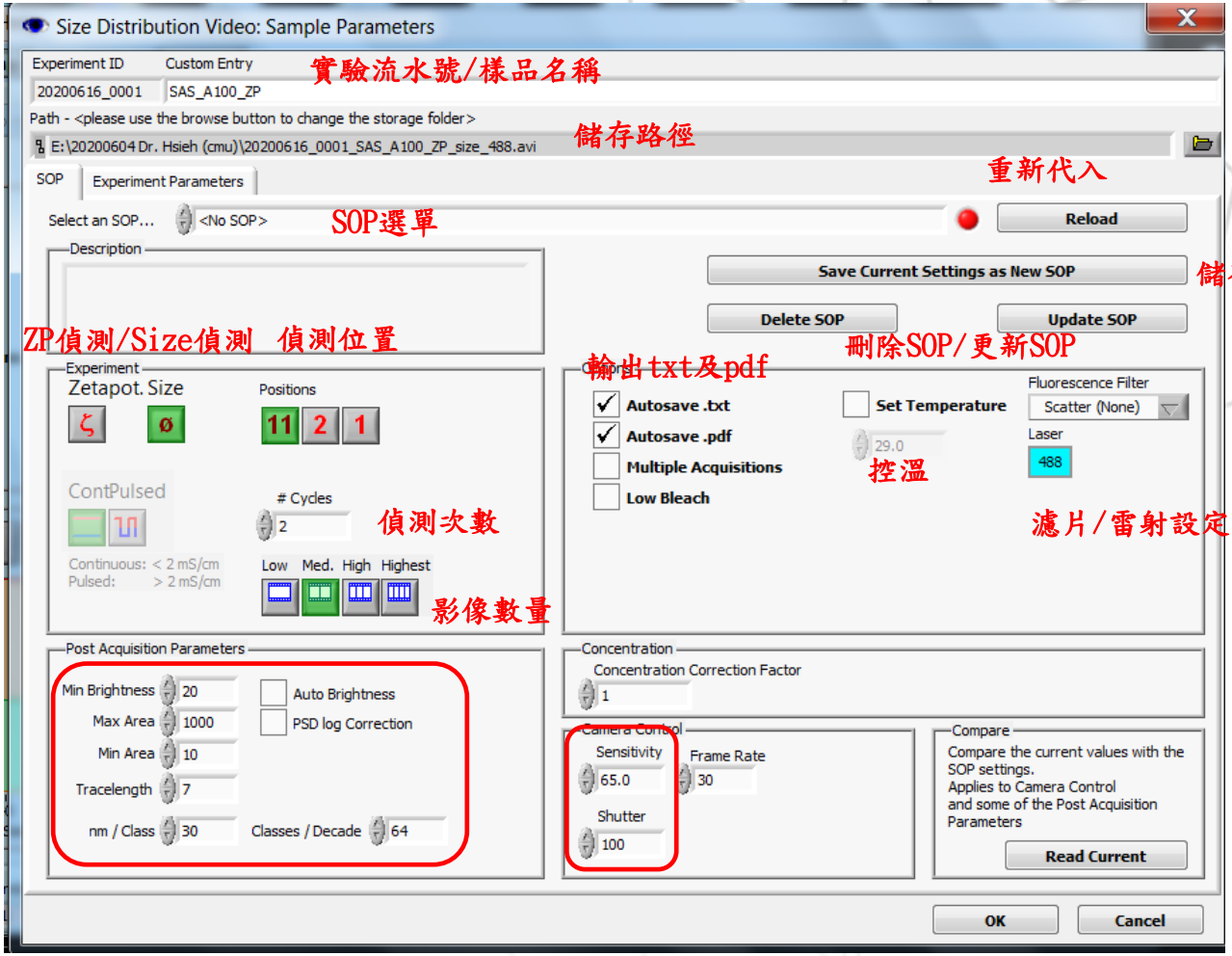
Pump & Temp


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Pump
Temperature
Continuous
Pump 1
6.7 mL / min
Pump 2
6.7 mL / min
幫浦流速
幫浦啟動及停止
Step Mode
Dosing Volume 1 / muL
19.8
Dosing Volume 2 / muL
19.9
劑量式頻率調整
幫浦啟動及停止
Temperature pH Conductivity
29.9 degC 49 muS/cm
Update Cond.

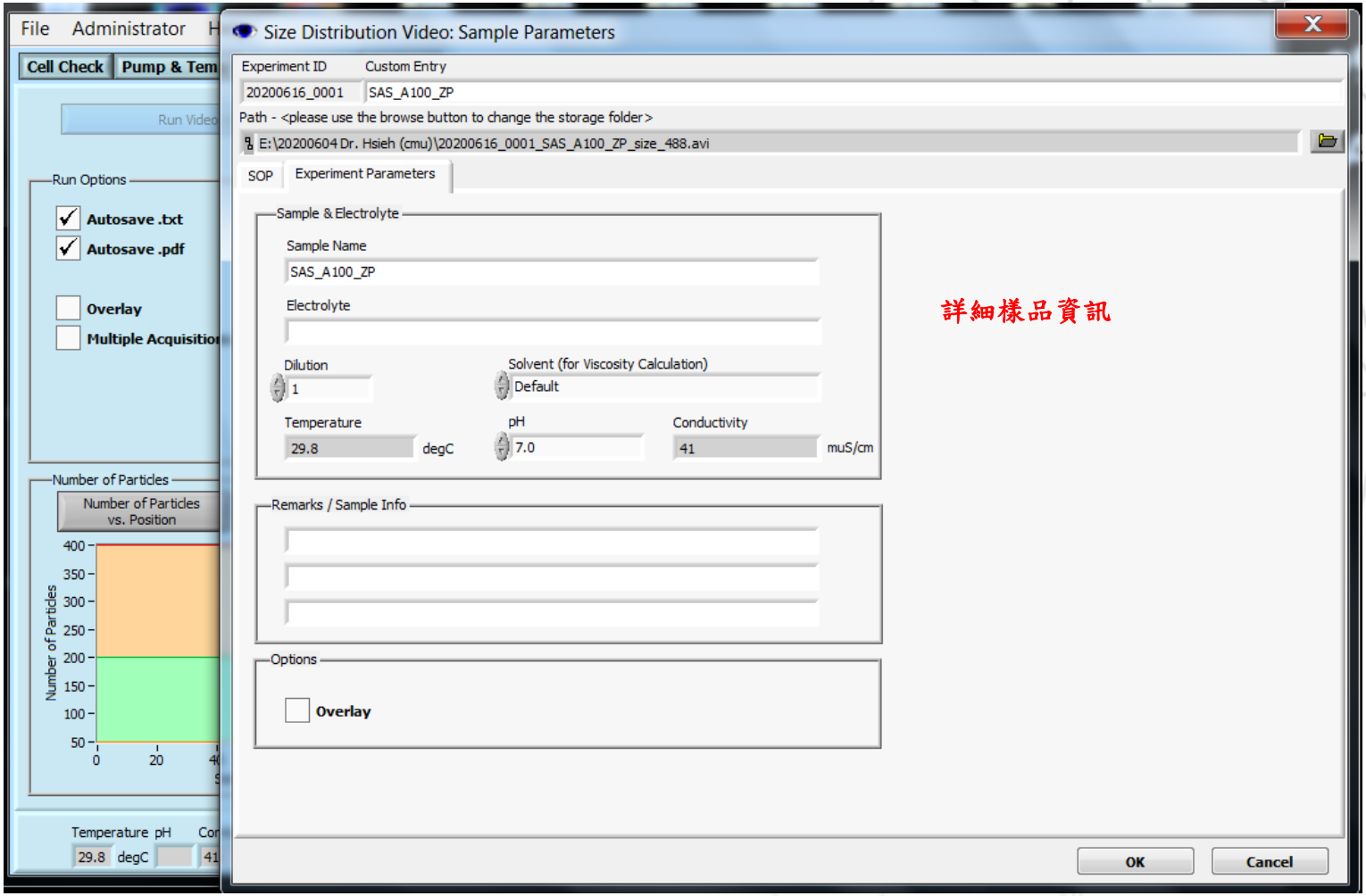

File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Pump
Temperature
Main
Temperature Control
Set Temperature
29.1
OFF
低於室溫5度或加熱至最高45度
Temperature pH Conductivity
29.9 degC 38 muS/cm
Update Cond.

Measurement

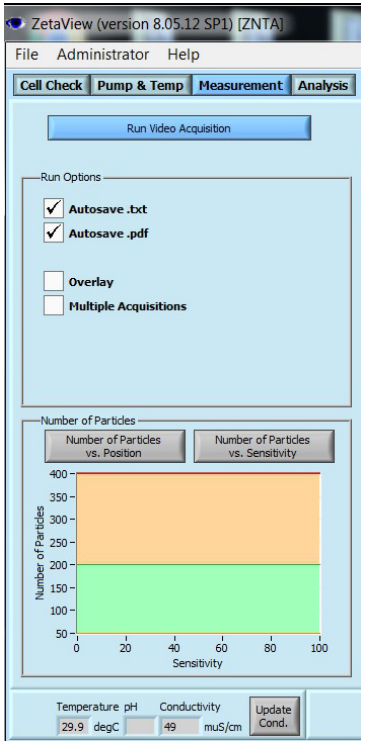


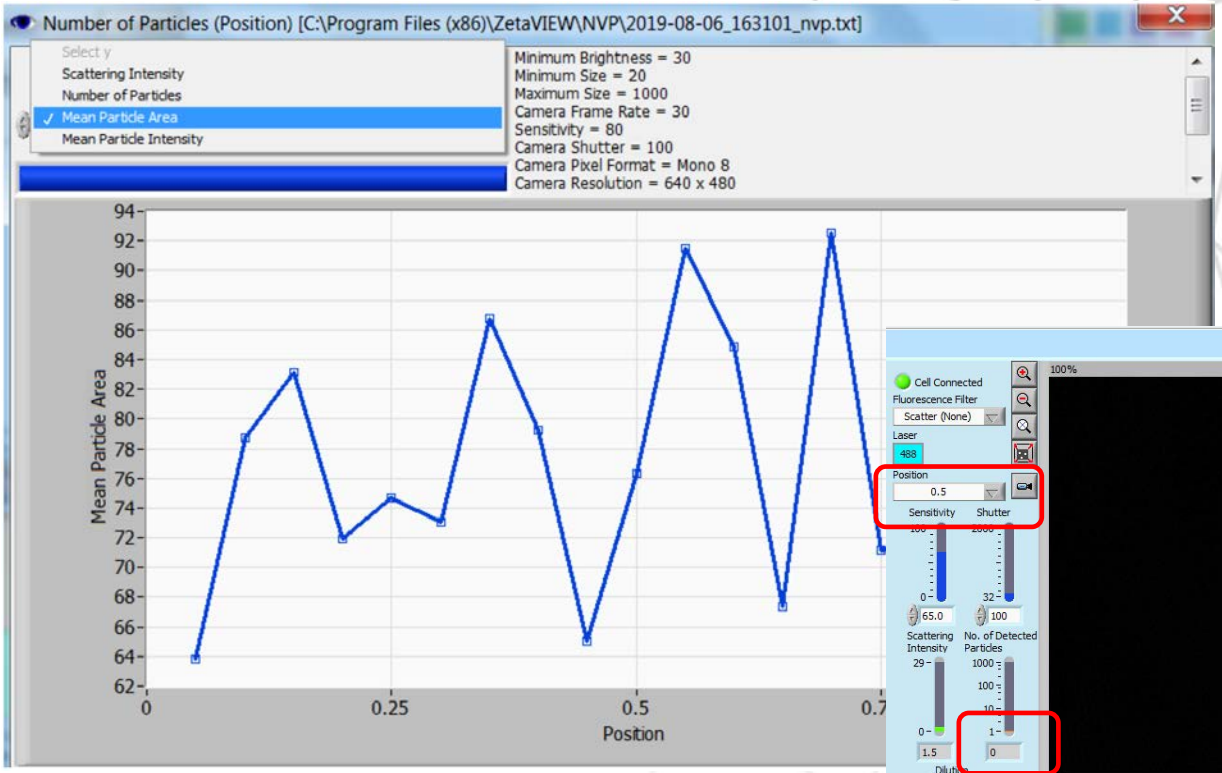


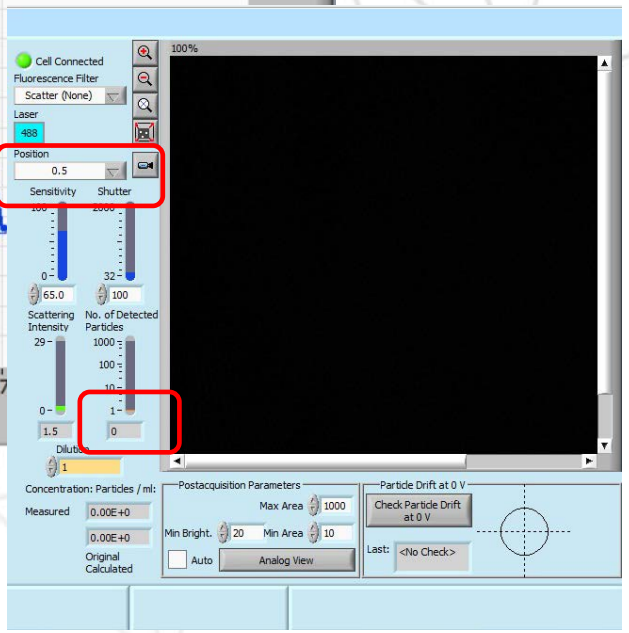
Measurement - Experiment Parameters



No. of Detected Particles vs Positions

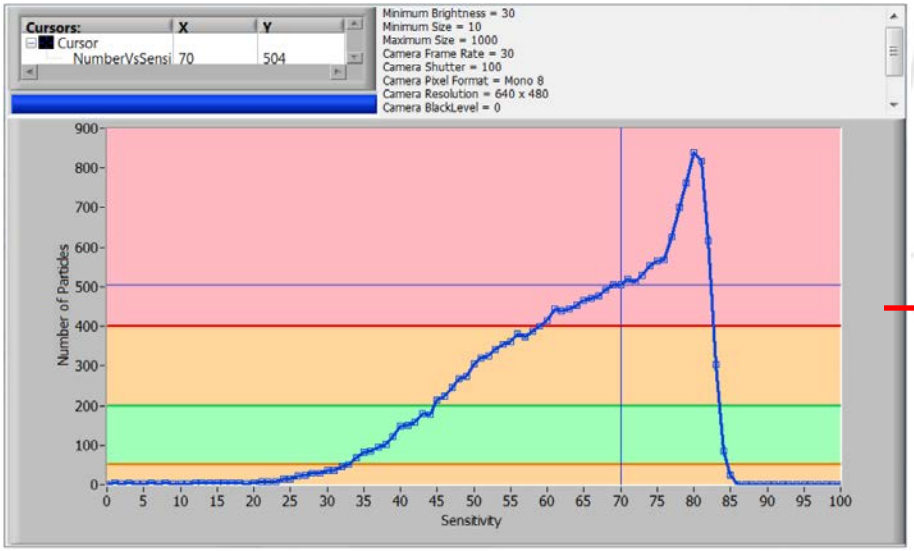


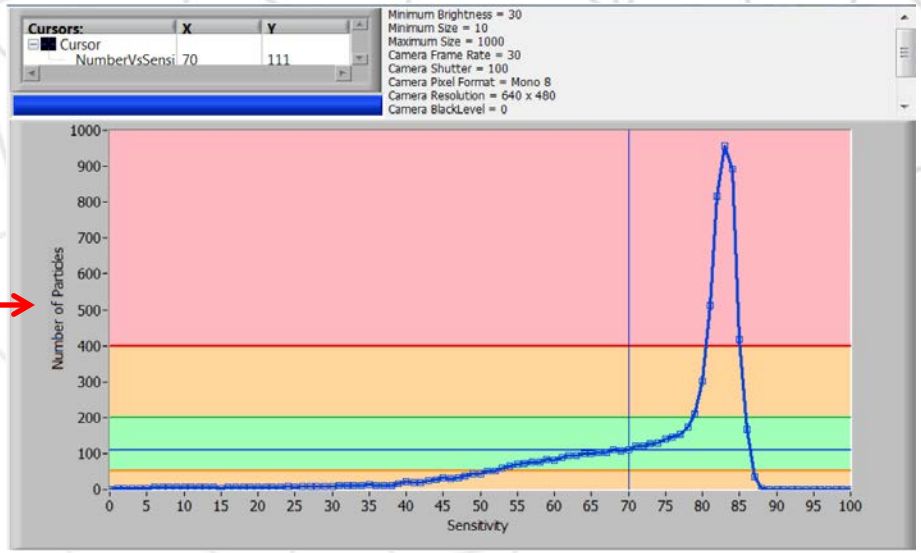




No. of Particle vs Sensitivity

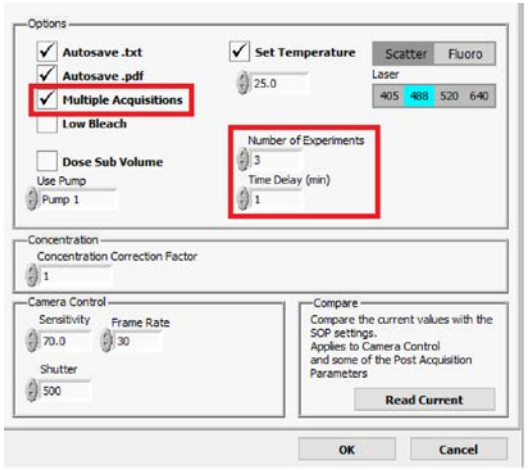
1. Unknown sample for sensitivity determination.
2. Dilution factor determination

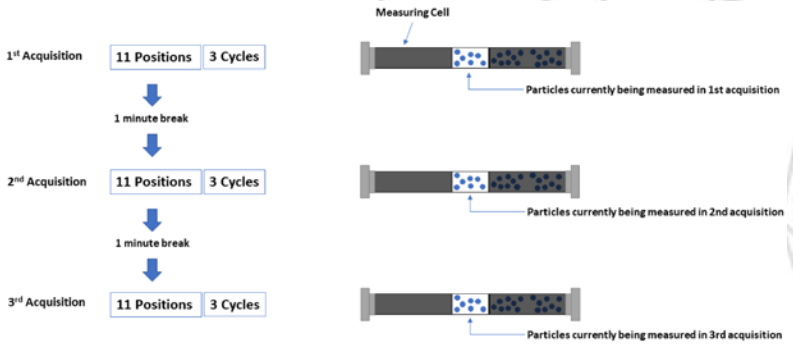


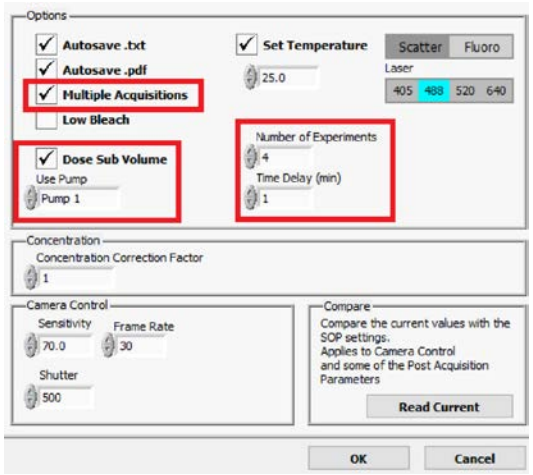


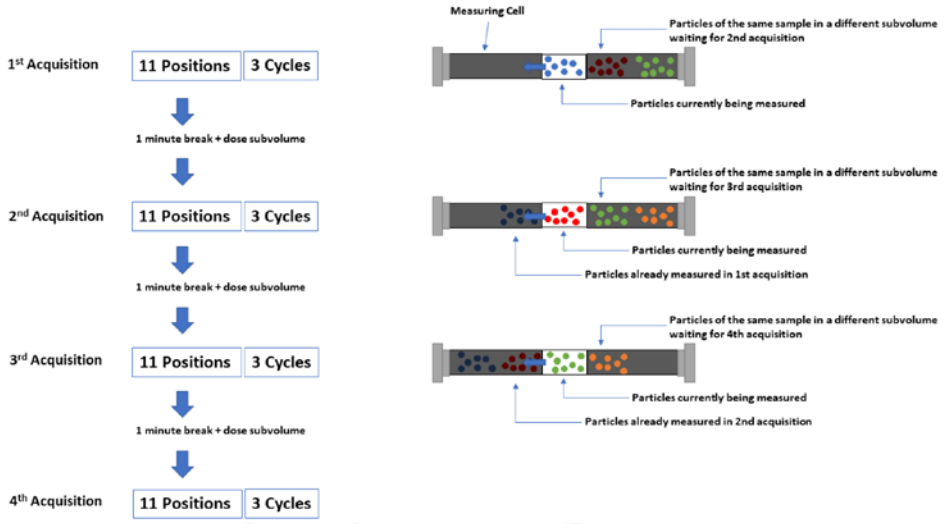
The sample was diluted 1:100,000 and should be diluted again by a factor of 5 to 1: 500,000.

Multiple Acquisitions

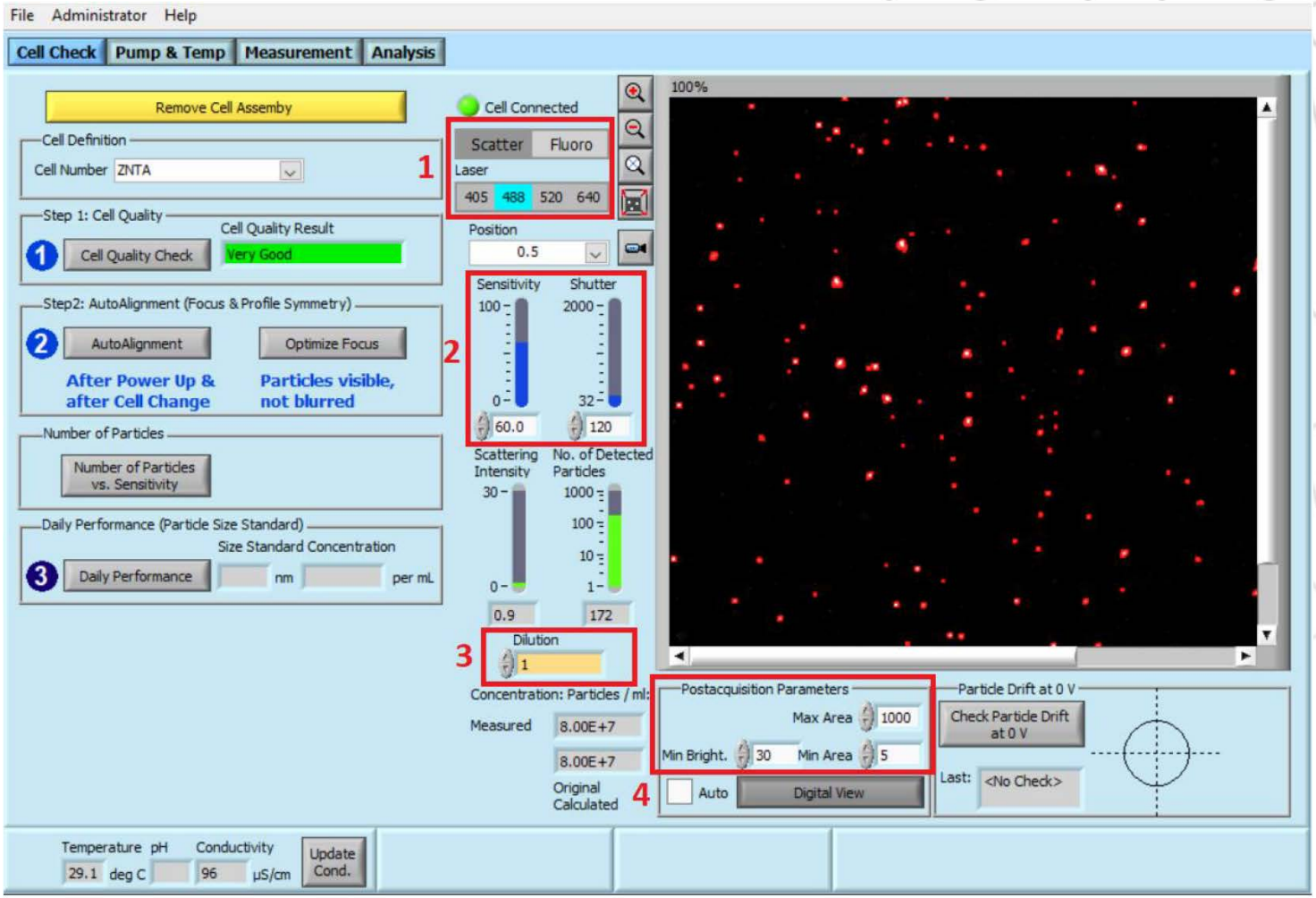




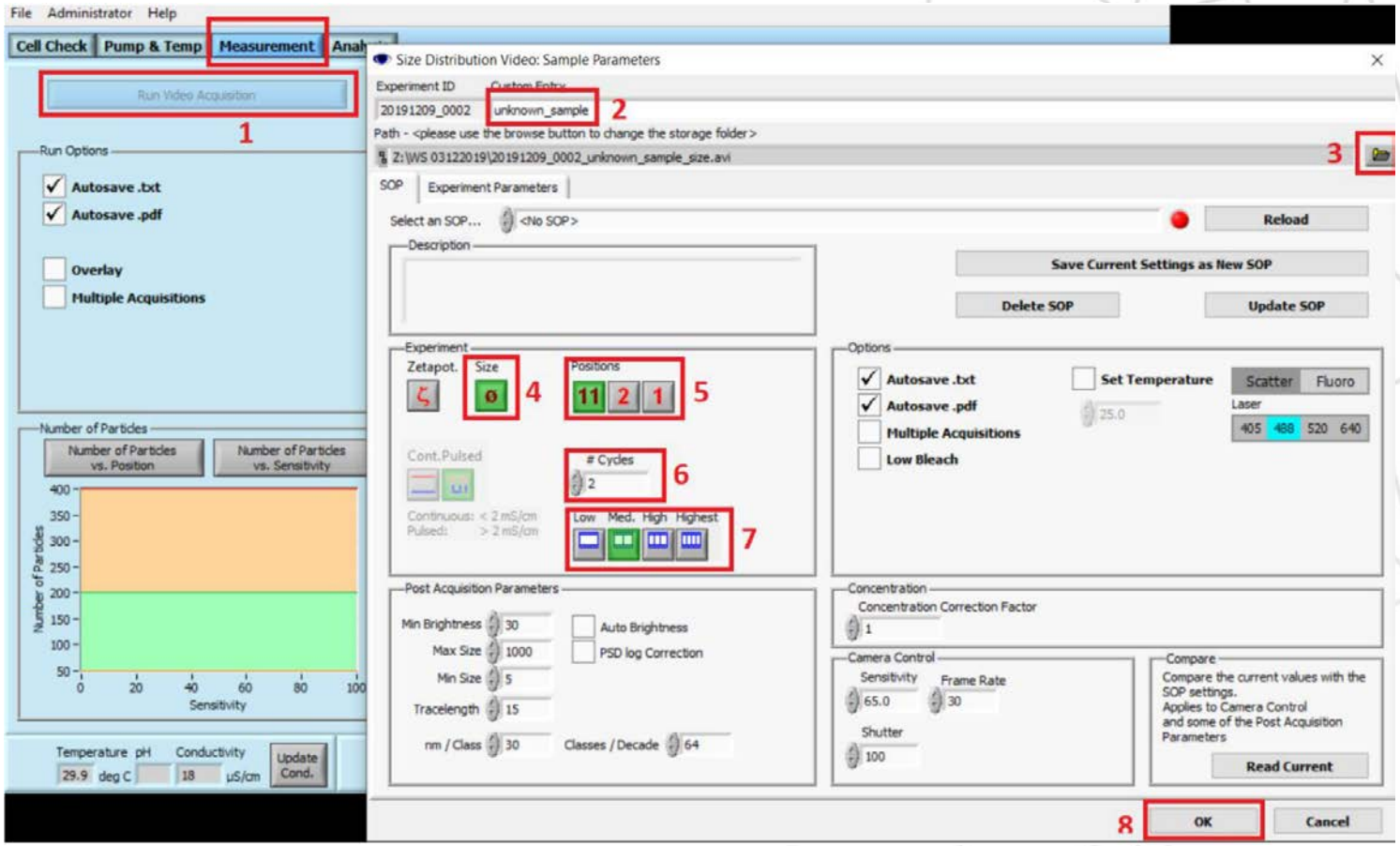




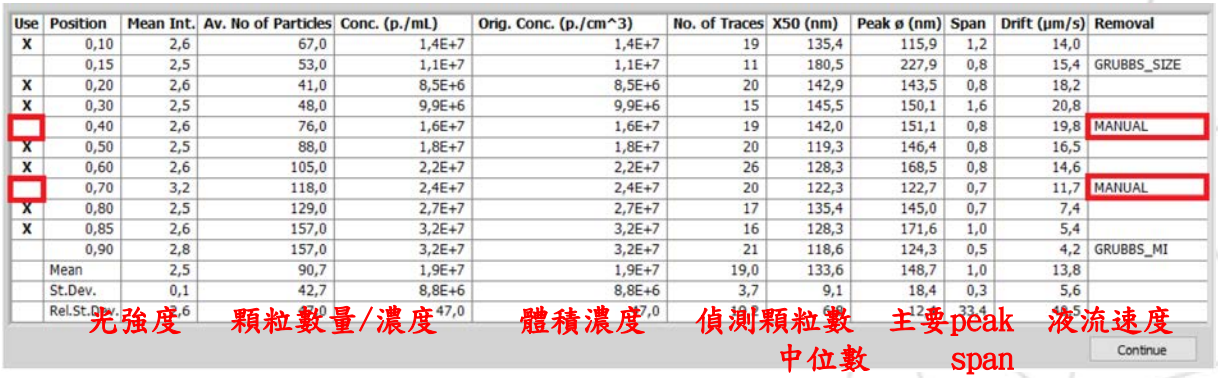
S and F Measurement Steps - 1



S and F Measurement Steps - 2



Data of 11 positions



Use	Position	Mean Int.	Av. No of Particles	Conc. (p./mL)	Orig. Conc. (p./cm^3)	No. of Traces	X50 (nm)	Peak ø (nm)	Span	Drift (µm/s)	Removal
X	0,10	2,6	67,0	1,4E+7	1,4E+7	19	135,4	115,9	1,2	14,0	
	0,15	2,5	53,0	1,1E+7	1,1E+7	11	180,5	227,9	0,8	15,4	GRUBBS_SIZE
X	0,20	2,6	41,0	8,5E+6	8,5E+6	20	142,9	143,5	0,8	18,2	
X	0,30	2,5	48,0	9,9E+6	9,9E+6	15	145,5	150,1	1,6	20,8	
	0,40	2,6	76,0	1,6E+7	1,6E+7	19	142,0	151,1	0,8	19,8	MANUAL
X	0,50	2,5	88,0	1,8E+7	1,8E+7	20	119,3	146,4	0,8	16,5	
X	0,60	2,6	105,0	2,2E+7	2,2E+7	26	128,3	168,5	0,8	14,6	
	0,70	3,2	118,0	2,4E+7	2,4E+7	20	122,3	122,7	0,7	11,7	MANUAL
X	0,80	2,5	129,0	2,7E+7	2,7E+7	17	135,4	145,0	0,7	7,4	
X	0,85	2,6	157,0	3,2E+7	3,2E+7	16	128,3	171,6	1,0	5,4	
	0,90	2,8	157,0	3,2E+7	3,2E+7	21	118,6	124,3	0,5	4,2	GRUBBS_MI
	Mean	2,5	90,7	1,9E+7	1,9E+7	19,0	133,6	148,7	1,0	13,8	
	St.Dev.	0,1	42,7	8,8E+6	8,8E+6	3,7	9,1	18,4	0,3	5,6	
	Rel.St.Dev.	2,6	47,0	47,0	47,0	19,1	6,8	12,4	33,4	40,5	

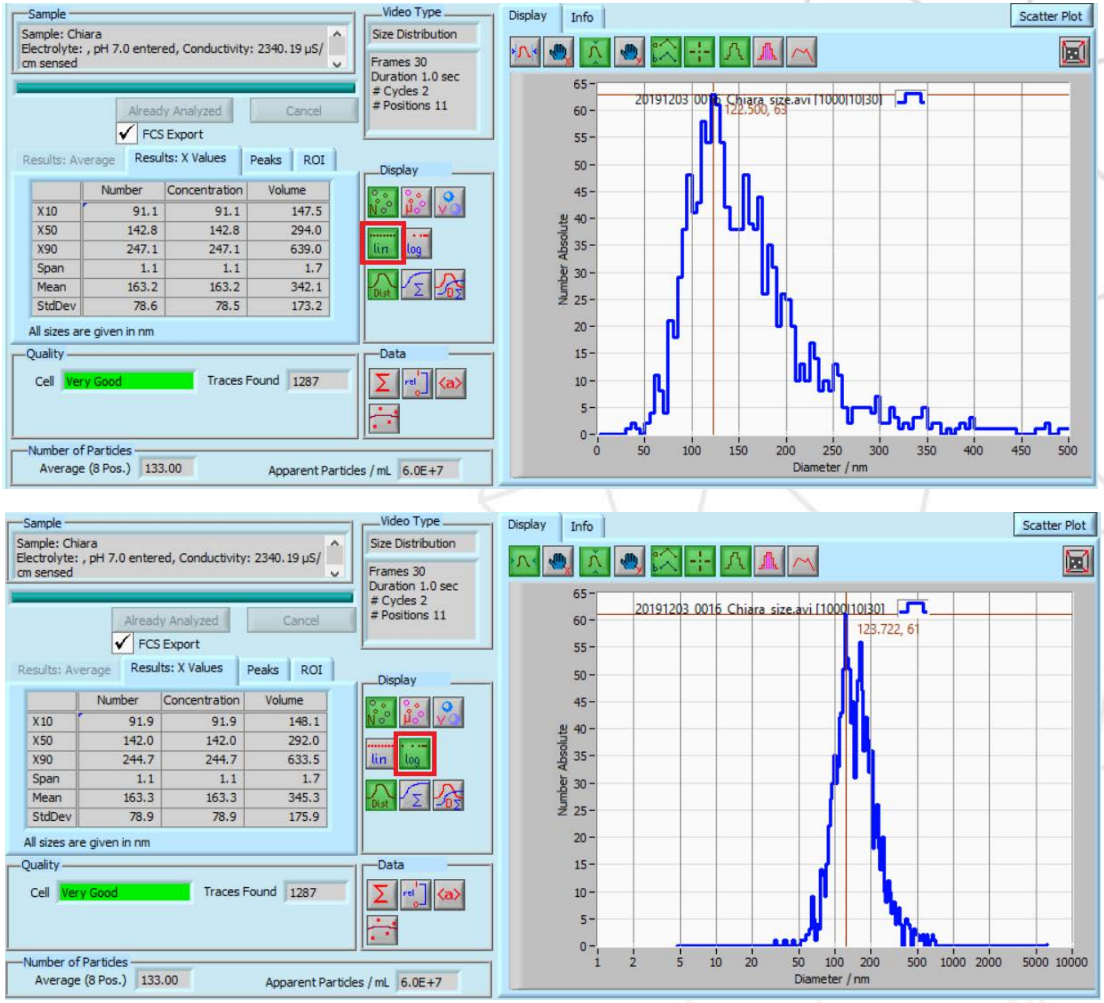
Continue

光強度　顆粒數量/濃度　體積濃度　偵測顆粒數中位數　主要peak span　液流速度

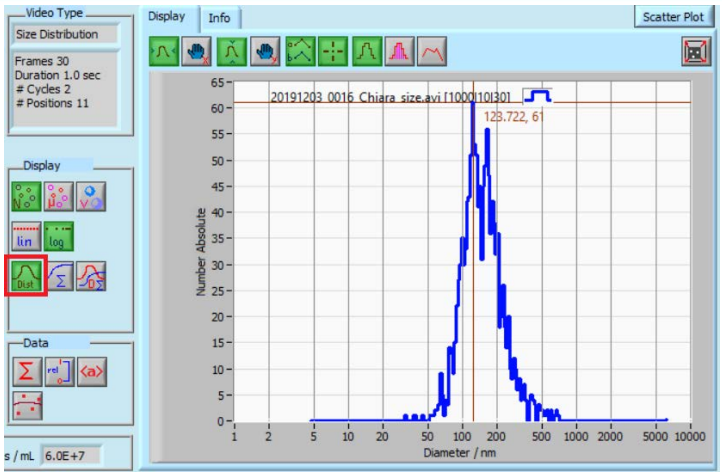
項目	異常值訊息	定義位置	說明	可能原因
1	Min_Traces	No. of Traces	偵測顆粒需要大於5顆。少於5顆即出現此訊息。	顆粒過少；樣品濃度過低。
2	Max_Drift	Drift	顆粒流動速度大於30um/sec。	溫度過高；緩衝液離子濃度或黏度不同；緩衝液滲漏；管路內含過多氣泡。
3	Range_Size	Peak Diameter	偵測到小於10 nm或大於3000 nm之顆粒。	超過偵測極限，數值不準確。
4	Range_Number	Av. No. of Particles	偵測到平均顆粒數少於10顆或大於800顆。	樣品濃度過低或過高。
5	GRUBBS_Number	Av. No. of Particles	顆粒數量與其他位置差異過大。	樣品未平均分布。
6	GRUBBS_MI	Mean Int.	光強度與其他位置差異過大。	氣泡；顆粒過大；高可見光顆粒汙染；游離螢光染劑；蛋白質汙染；顯微鏡頭太靠近樣品槽(自動校正發生問題)。
7	GRUBBS_SIZE	Peak Diameter	顆粒大小與其他位置差異過大。	樣品未平均分布。

Linear and Logarithmic Plotting

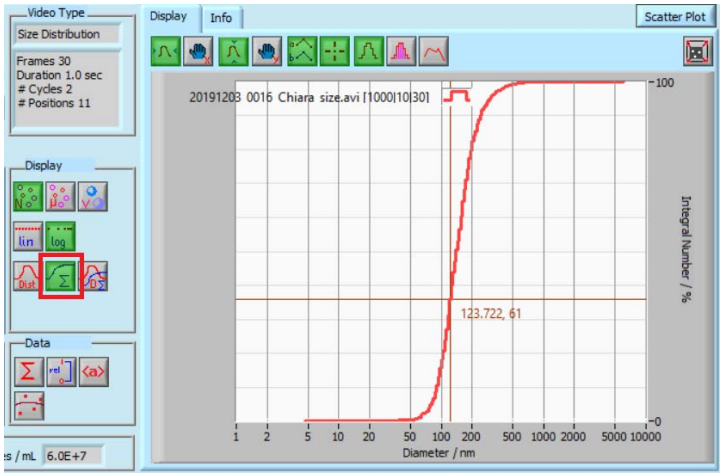
v



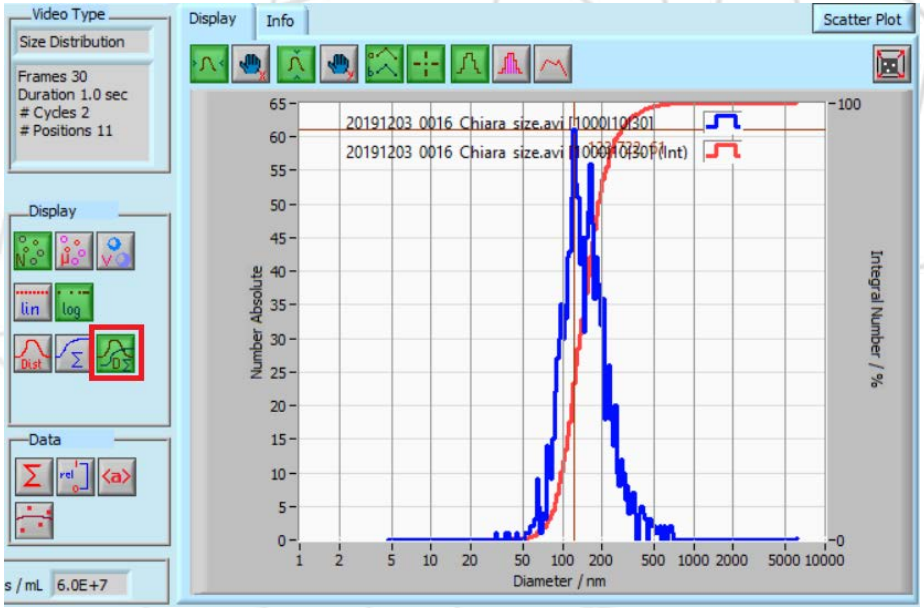
Distributive and Cumulative Plotting



Distributive

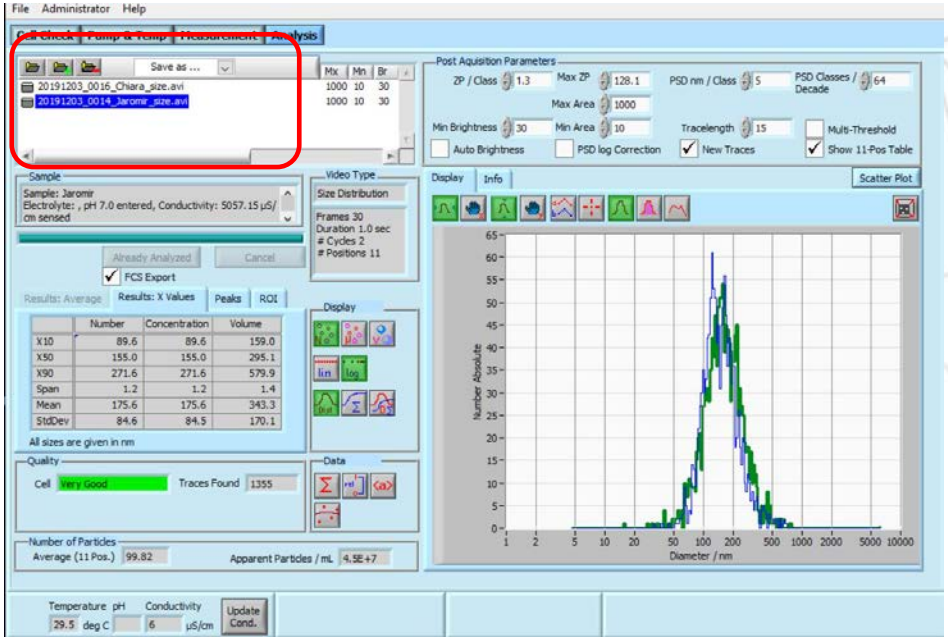


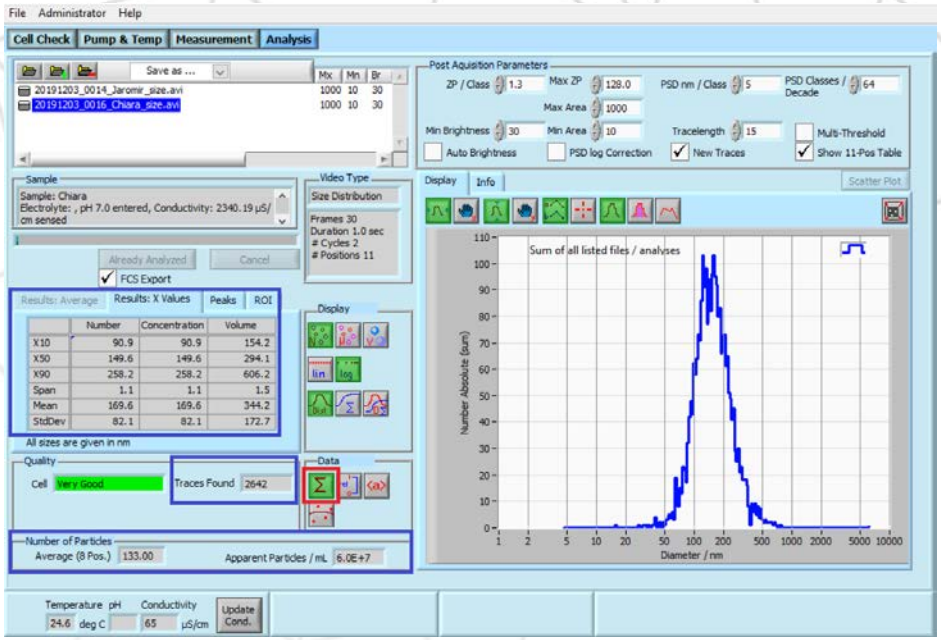
Cumulative



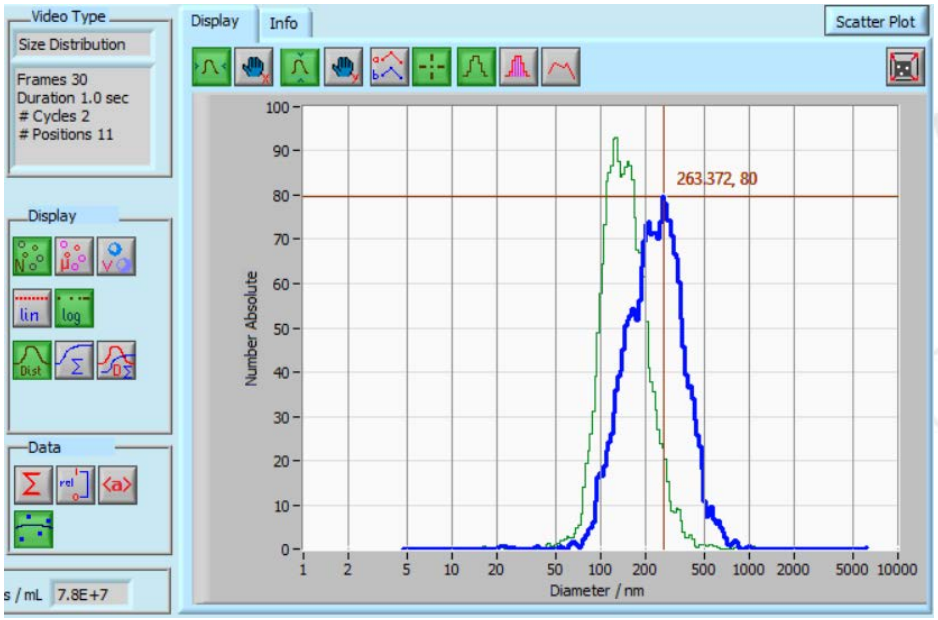
Overlay

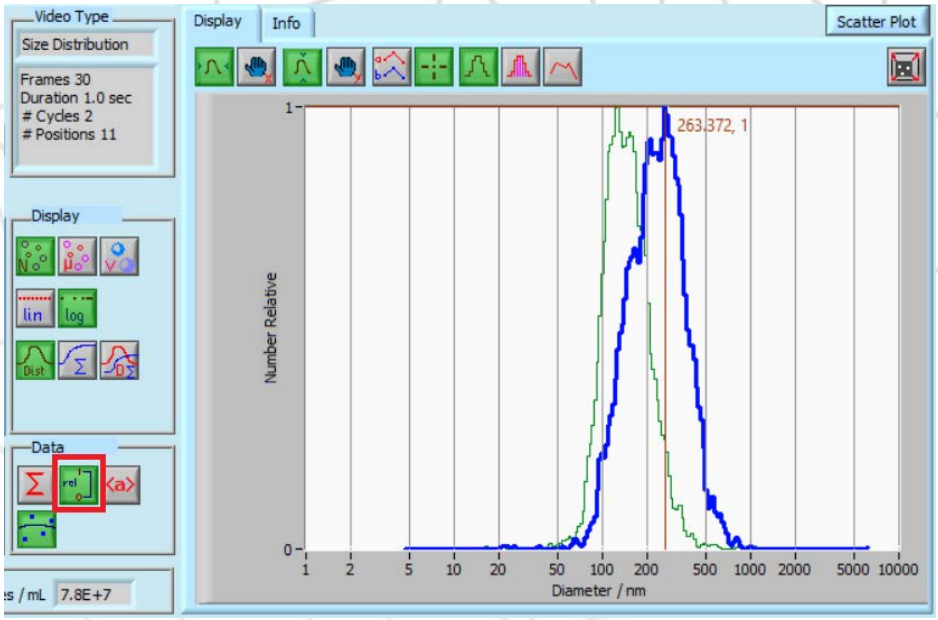
Summation


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Save as ...
20191203_0016_Chiara_size.avi
20191203_0014_Jaromir_size.avi
Post Aquisition Parameters
ZP / Class 1.3
Max ZP 128.1
PSD nm / Class 5
PSD Classes / Decade 64
Max Area 1000
Min Brightness 30
Min Area 10
Tracelength 15
Auto Brightness
PSD log Correction
New Traces
Multi-Threshold
Show 11-Pos Table
Sample
Sample: Jaromir
Electrolyte: , pH 7.0 entered, Conductivity: 5057.15 µS/cm sensed
Video Type
Size Distribution
Frames 30
Duration 1.0 sec
Cycles 2
Positions 11
Already Analyzed
Cancel
FCS Export
Results: Average
Results: X Values
Peaks
ROI
Number Concentration Volume
X10 89.6 89.6 159.0
X50 155.0 155.0 295.1
X90 271.6 271.6 579.9
Span 1.2 1.2 1.4
Mean 175.6 175.6 343.3
StdDev 84.6 84.5 170.1
All sizes are given in nm
Display
Data
Quality
Cell Very Good
Traces Found 1355
Number of Particles
Average (11 Pos.) 99.82
Apparent Particles / mL 4.5E+7
Display
Info
Scatter Plot
Number Absolute
Diameter / nm
Temperature pH Conductivity
29.5 deg C 6 µS/cm
Update Cond.

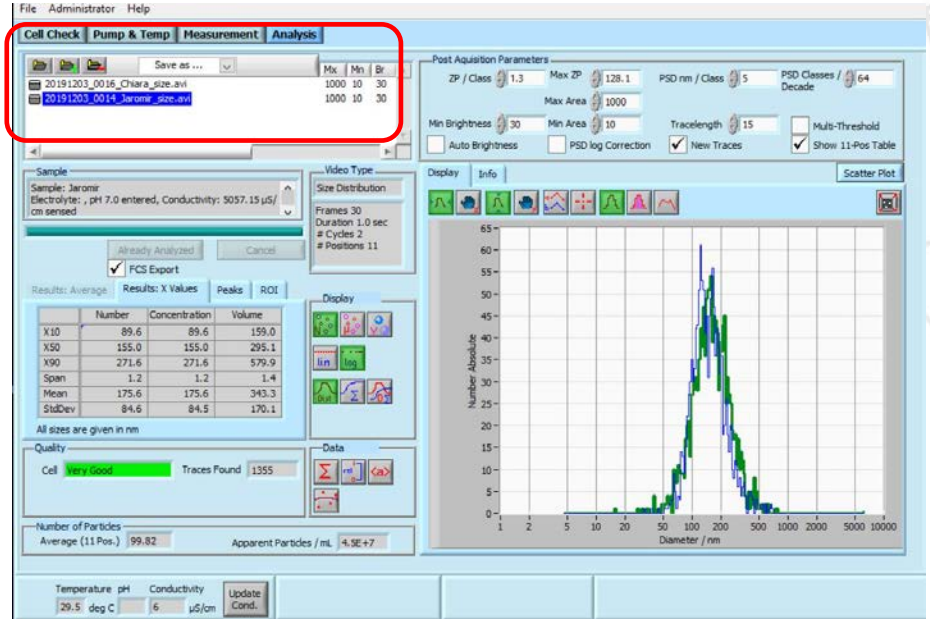

File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Save as ...
20191203_0014_Jaromir_size.avi
20191203_0016_Chiara_size.avi
Post Aquisition Parameters
ZP / Class 1.3
Max ZP 128.0
PSD nm / Class 5
PSD Classes / Decade 64
Max Area 1000
Min Brightness 30
Min Area 10
Tracelength 15
Auto Brightness
PSD log Correction
New Traces
Multi-Threshold
Show 11-Pos Table
Sample
Sample: Chiara
Electrolyte: , pH 7.0 entered, Conductivity: 2340.19 µS/cm sensed
Video Type
Size Distribution
Frames 30
Duration 1.0 sec
Cycles 2
Positions 11
Already Analyzed
Cancel
FCS Export
Results: Average
Results: X Values
Peaks
ROI
Number Concentration Volume
X10 90.9 90.9 154.2
X50 149.6 149.6 294.1
X90 258.2 258.2 606.2
Span 1.1 1.1 1.5
Mean 169.6 169.6 344.2
StdDev 82.1 82.1 172.7
All sizes are given in nm
Display
Data
Quality
Cell Very Good
Traces Found 2642
Number of Particles
Average (8 Pos.) 133.00
Apparent Particles / mL 6.0E+7
Display
Info
Scatter Plot
Sum of all listed files / analyses
Number Absolute (sum)
Diameter / nm
Temperature pH Conductivity
24.6 deg C 65 µS/cm
Update Cond.

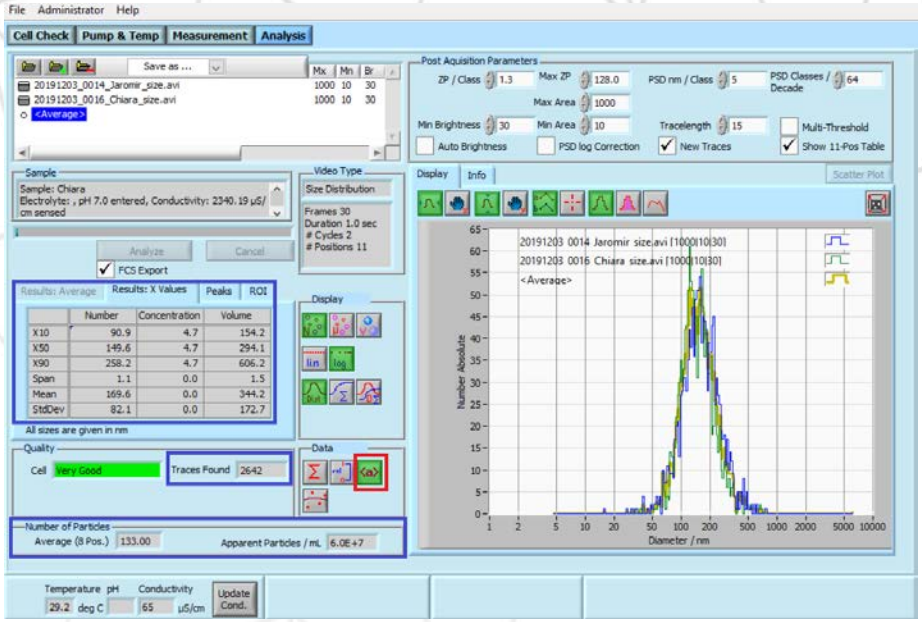
Normalization



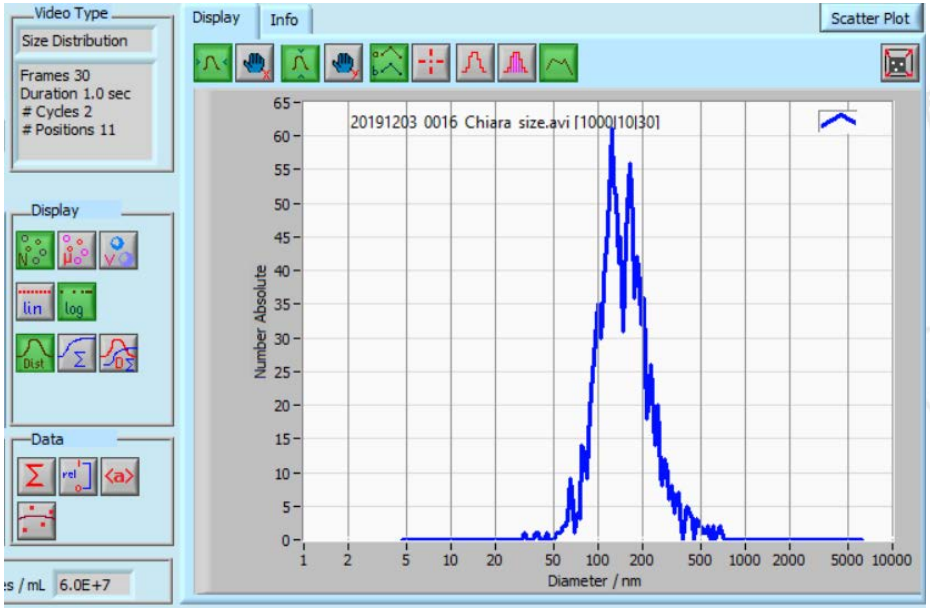


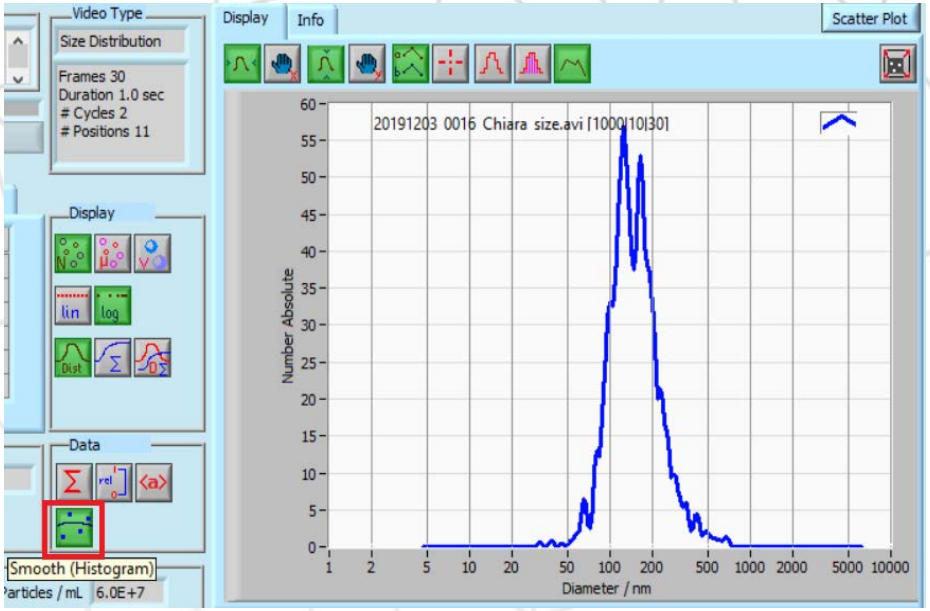
Averaging


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
20191203_0016_Chiara_size.avi
20191203_0014_Jaromir_size.avi
Post Aquisition Parameters
Sample
Video Type
Size Distribution
Display
Info
Scatter Plot
FCS Export
Results: X Values
Peaks
ROI
Number
Concentration
Volume
X10 89.6 89.6 159.0
X50 155.0 155.0 295.1
X90 271.6 271.6 579.9
Span 1.2 1.2 1.4
Mean 175.6 175.6 343.3
StdDev 84.6 84.5 170.1
All sizes are given in nm
Quality
Cell Very Good
Traces Found 1355
Data
Number of Particles
Average (11 Pos.) 99.82
Apparent Particles / mL 4.5E+7
Number Absolute
Diameter / nm
Temperature pH Conductivity
29.5 deg C 6 µS/cm
Update Cond.


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
20191203_0014_Jaromir_size.avi
20191203_0016_Chiara_size.avi
<Average>
Post Aquisition Parameters
Sample
Video Type
Size Distribution
Display
Info
Scatter Plot
FCS Export
Results: X Values
Peaks
ROI
Number
Concentration
Volume
X10 90.9 4.7 154.2
X50 149.6 4.7 294.1
X90 258.2 4.7 606.2
Span 1.1 0.0 1.5
Mean 169.6 0.0 344.2
StdDev 82.1 0.0 172.7
All sizes are given in nm
Quality
Cell Very Good
Traces Found 2642
Data
Number of Particles
Average (8 Pos.) 133.00
Apparent Particles / mL 6.0E+7
20191203 0014 Jaromir size.avi [1000|10|30]
20191203 0016 Chiara size.avi [1000|10|30]
<Average>
Number Absolute
Diameter / nm
Temperature pH Conductivity
29.2 deg C 65 µS/cm
Update Cond.

Smoothing



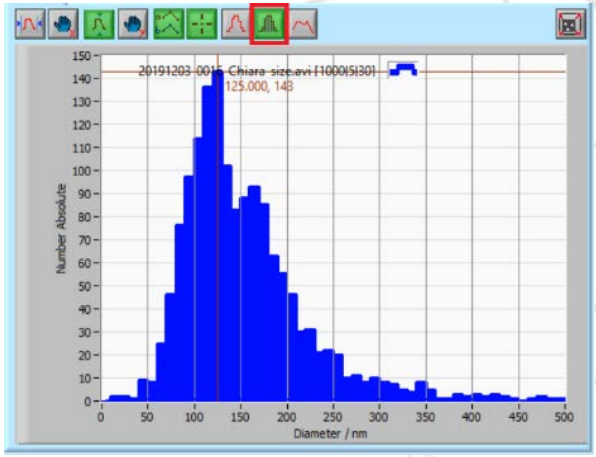


No effect on the percentiles or other measurement results

Presentation

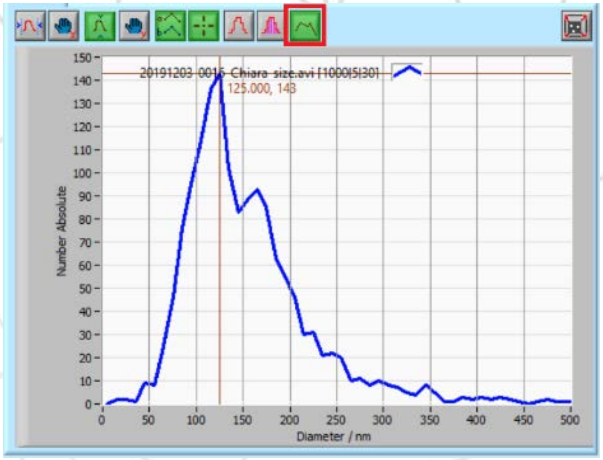


Step plot



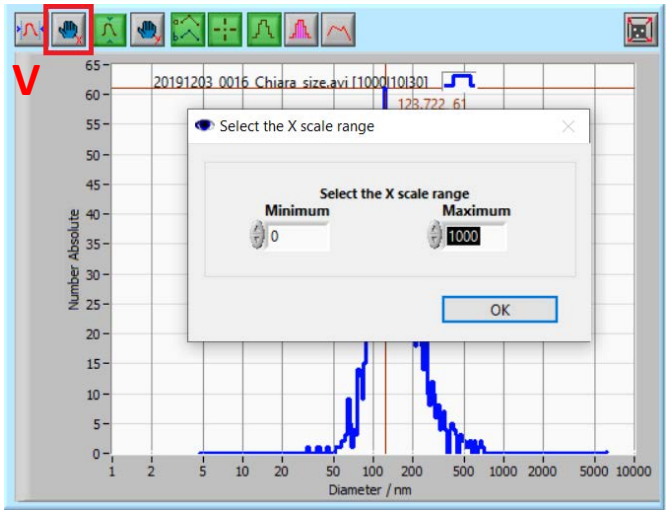
Bar plot

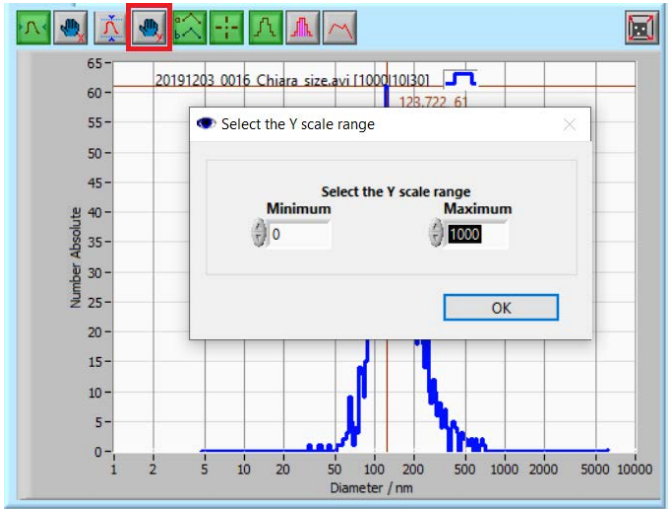
V

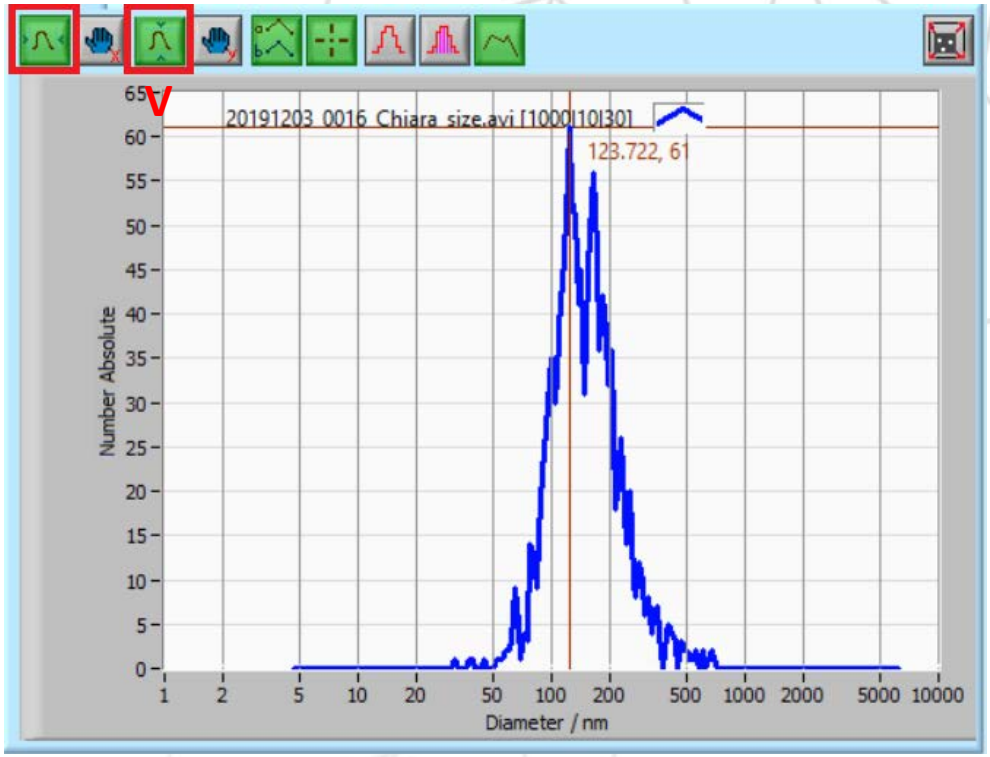


Line plot

Scaling of X-axis and Y-axis







X Values, Peaks and ROI

Results: Average | Results: X Values | Peaks | ROI

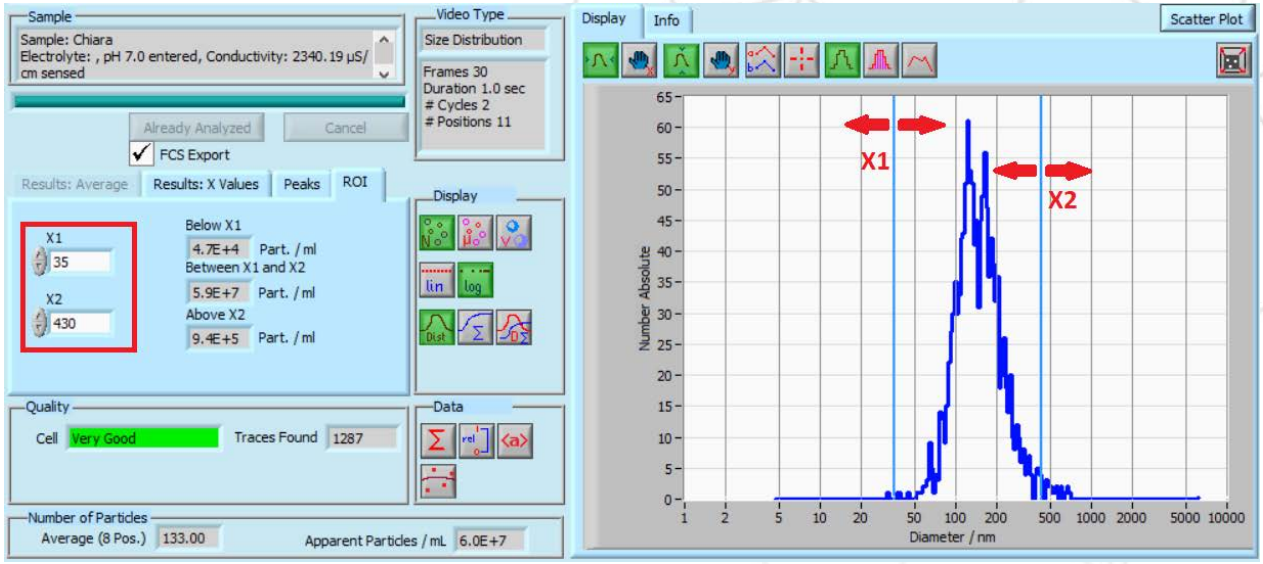
	Number	Concentration	Volume
X10	91.9	91.9	148.1
X50	142.0	142.0	292.0
X90	244.7	244.7	633.5
Span	1.1	1.1	1.7
Mean	163.3	163.3	345.3
StdDev	78.9	78.9	175.9

All sizes are given in nm

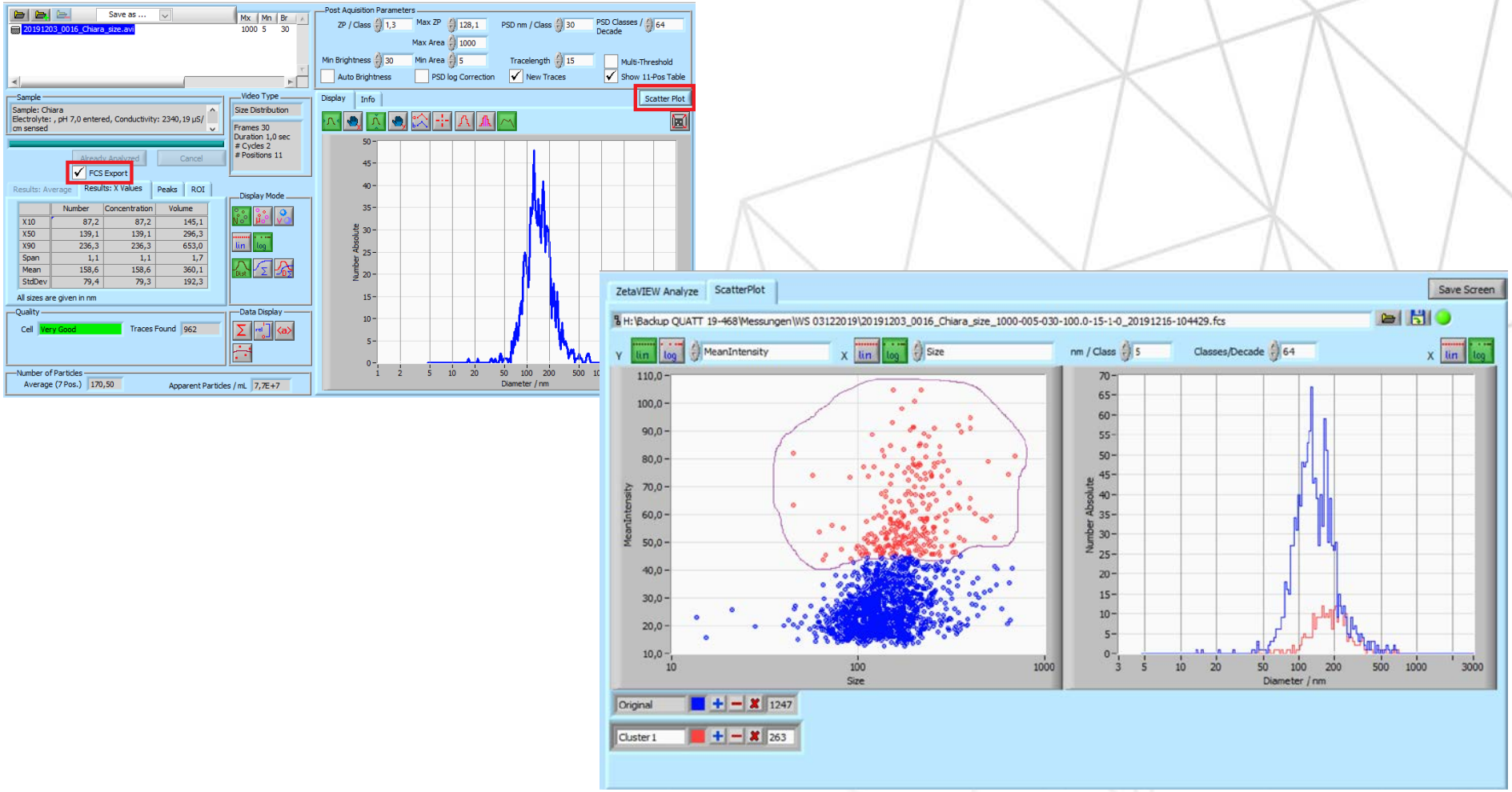
Results: Average | Results: X Values | Peaks | ROI

Diameter	No. Abs.	FWHM	%
126.9	56.3	48.7	50.5
165.7	52.4	61.1	49.5

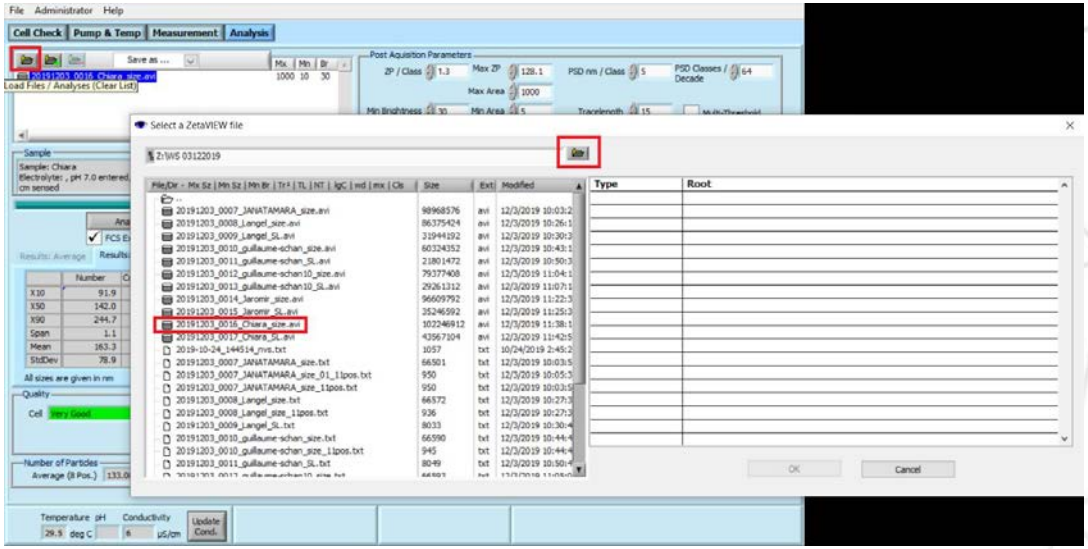
Diameter, FWHM in nm

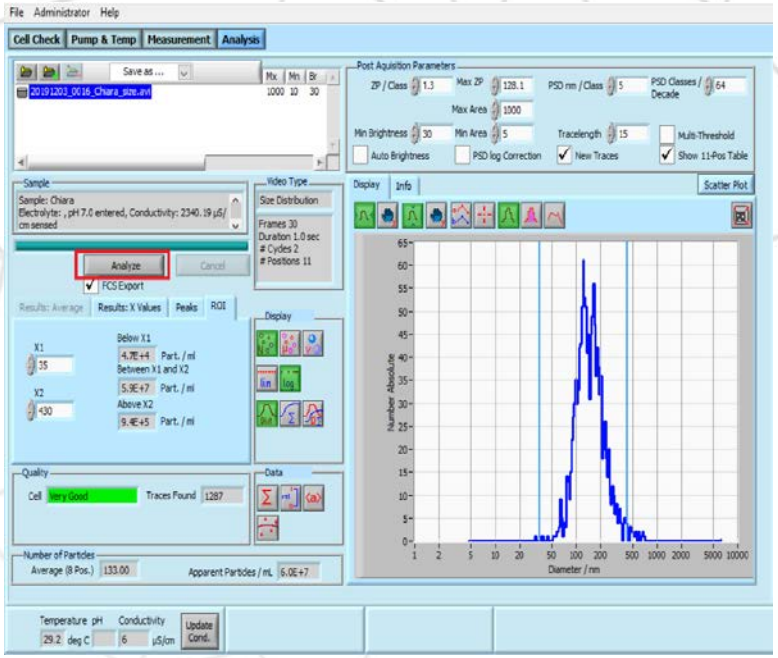


Scatter Plot Tab

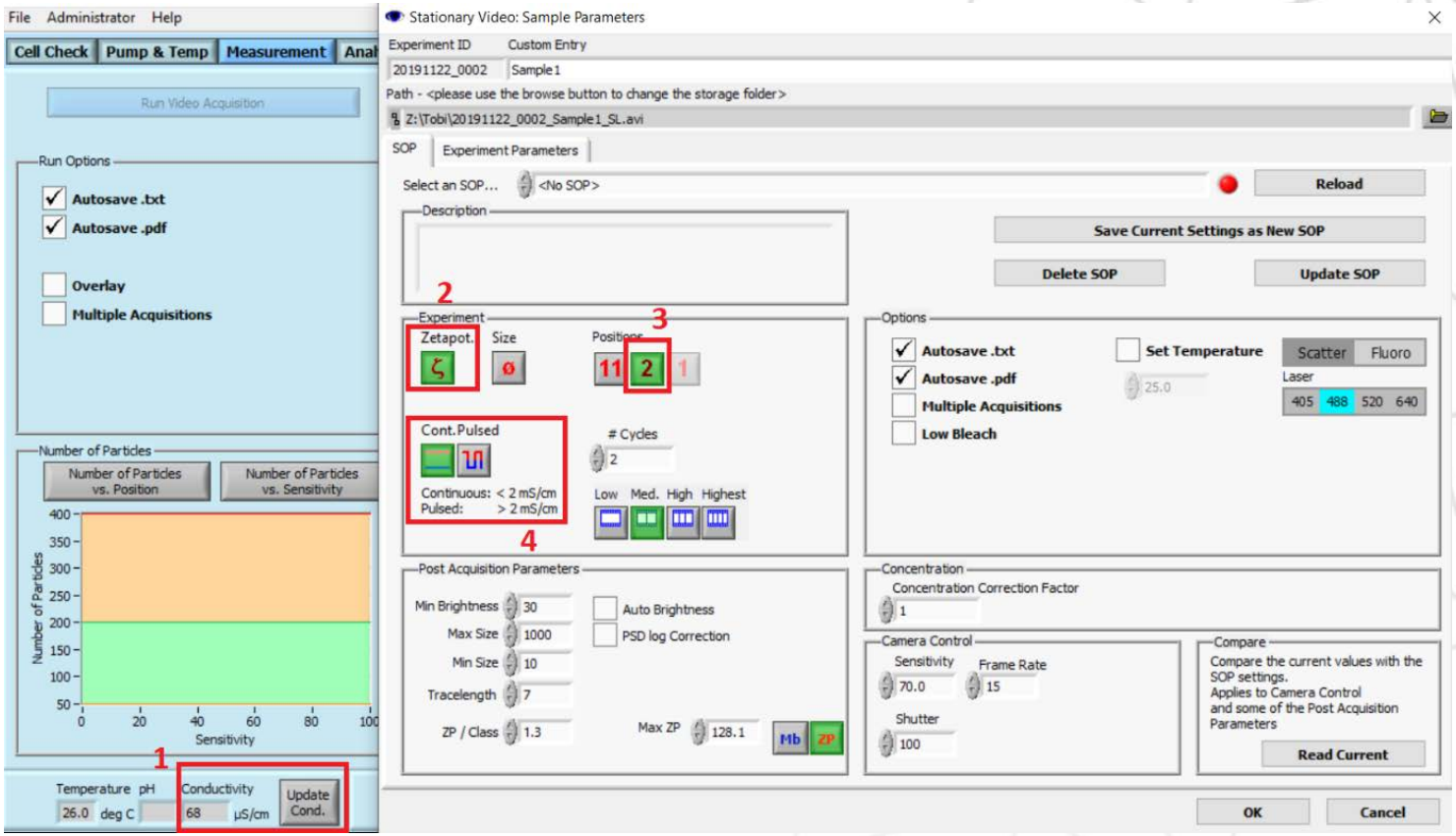


Re-Analysis


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Select a ZetaVIEW file
Z:\WS 03122019
Type
Root
OK
Cancel


File Administrator Help
Cell Check
Pump & Temp
Measurement
Analysis
Post Aquisition Parameters
Analyze
Cancel
FCS Export
Results: X Values
Peaks
ROI
Quality
Very Good
Number of Particles
Temperature pH
Conductivity
Update Cond.
Number Absolute
Diameter / nm

Zeta Potential Measurement



Exported Data

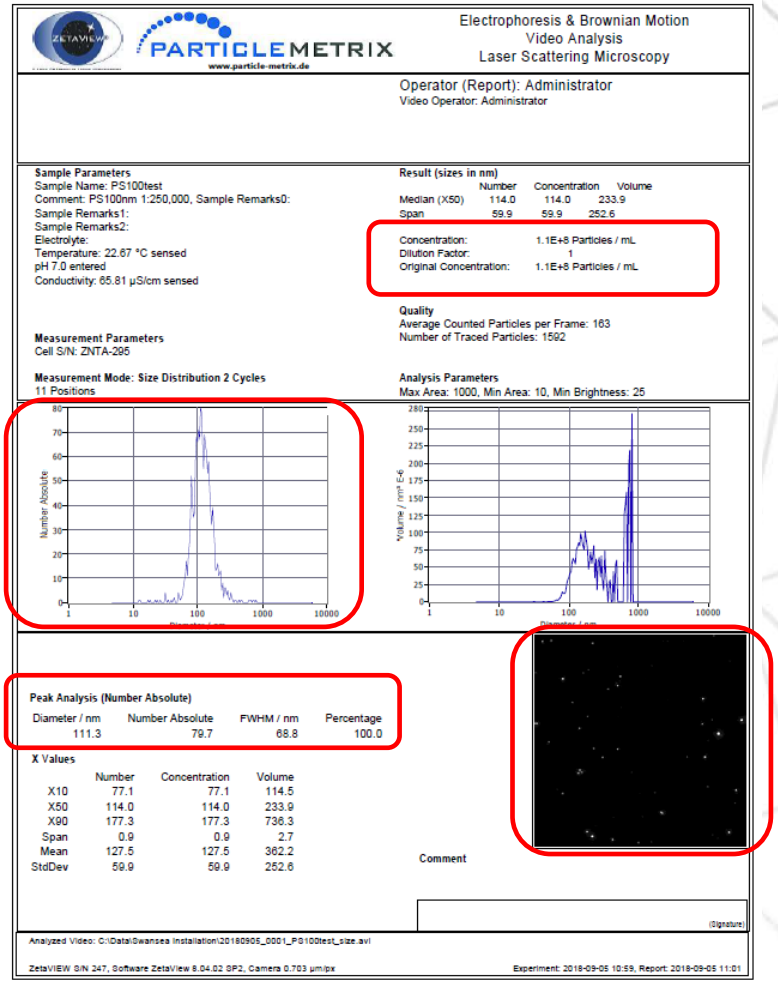
Exported PDF - Size

樣品及偵測資訊

圖譜（No. / Conc.-Weight）

主要peak資訊

統計



統計資訊（X50）

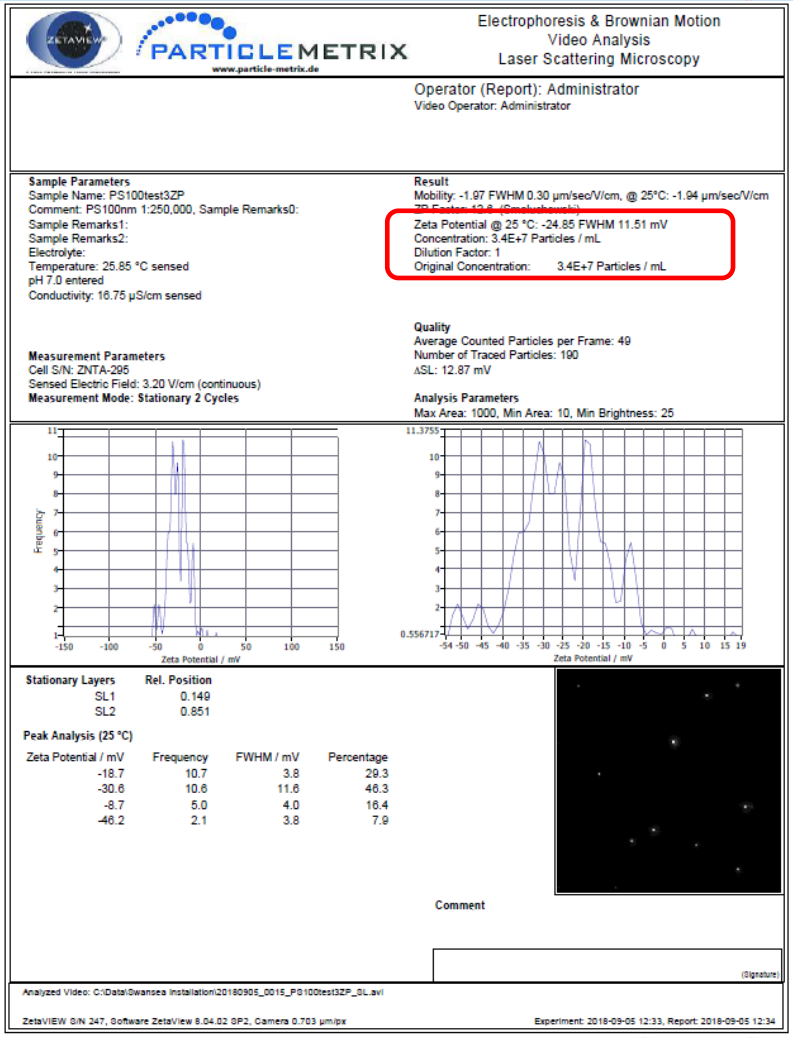
濃度

統計之粒子數量

圖譜（Volume-Weight）

即時影像截圖（隨機截圖）

Exported PDF - ZP



PARTICLEMETRIX
www.particle-metrix.de

Electrophoresis & Brownian Motion
Video Analysis
Laser Scattering Microscopy

Operator (Report): Administrator
Video Operator: Administrator

Sample Parameters
Sample Name: PS100test3ZP
Comment: PS100nm 1:250,000, Sample Remarks0:
Sample Remarks1:
Sample Remarks2:
Electrolyte:
Temperature: 25.85 °C sensed
pH 7.0 entered
Conductivity: 16.75 µS/cm sensed

Result
Mobility: -1.97 FWHM 0.30 µm/sec/V/cm, @ 25°C: -1.94 µm/sec/V/cm
ZP Factor: 12.8 (Smoluchowski)
Zeta Potential @ 25 °C: -24.85 FWHM 11.51 mV
Concentration: 3.4E+7 Particles / mL
Dilution Factor: 1
Original Concentration: 3.4E+7 Particles / mL

Quality
Average Counted Particles per Frame: 49
Number of Traced Particles: 190
ΔSL: 12.87 mV

Measurement Parameters
Cell S/N: ZNTA-295
Sensed Electric Field: 3.20 V/cm (continuous)
Measurement Mode: Stationary 2 Cycles

Analysis Parameters
Max Area: 1000, Min Area: 10, Min Brightness: 25

Frequency
Zeta Potential / mV

Stationary Layers **Rel. Position**
SL1 0.149
SL2 0.851

Peak Analysis (25 °C)

Zeta Potential / mV	Frequency	FWHM / mV	Percentage
-18.7	10.7	3.8	29.3
-30.6	10.6	11.6	46.3
-8.7	5.0	4.0	16.4
-46.2	2.1	3.8	7.9

Comment

(Signature)

Analyzed Video: C:\Data\Dwansea Installation\20180905_0015_PS100test3ZP_SL.avi

ZetaVIEW S/N 247, Software ZetaView 8.04.02 SP2, Camera 0.703 µm/px

Experiment: 2018-09-05 12:33, Report: 2018-09-05 12:34

樣品及偵測資訊

結果

統計之粒子數

圖譜

圖譜

SL數據

統計

即時影像截圖（隨機截圖）

EVs ZP: -15~-30

Lower than -30
- Bad sample quality
Higher than -15

- Bad sample quality and cause aggregation

Raw Data - Txt File

```
Reference Electrode Distance:   5.150000
Voltage:        0.000000
Polarity:       0
Reference Voltage:      0.000000
Microscope Magnification:       x10
Laser Wavelength:       405.000000
ZP Factor:      12.828778 (Smoluchowski)Results (Pos 0.100004):
Median Number (D50):    214.787748
Median Concentration (D50):     214.787748
Median Volume (D50):    356.540467
Size Distribution
Size / nm       Number  Concentration / cm-3    Volume / nm^3   Area / nm^2
2.500E+0        0.000E+0        0.000E+0        0.000E+0        0.000E+0
7.500E+0        1.000E+0        4.698E+4        2.209E+2        4.418E+1
1.250E+1        2.000E+0        9.396E+4        2.045E+3        2.454E+2
1.750E+1        2.000E+0        9.396E+4        5.612E+3        4.811E+2
2.250E+1        1.000E+0        4.698E+4        5.964E+3        3.978E+2
2.750E+1        1.000E+0        4.698E+4        1.089E+4        5.940E+2
3.250E+1        2.000E+0        9.396E+4        3.595E+4        1.659E+3
3.750E+1        3.000E+0        1.409E+5        8.283E+4        3.313E+3
4.250E+1        3.000E+0        1.409E+5        1.206E+5        4.256E+3
4.750E+1        4.000E+0        1.879E+5        2.245E+5        7.088E+3
5.250E+1        4.000E+0        1.879E+5        3.031E+5        8.659E+3
5.750E+1        6.000E+0        2.819E+5        5.972E+5        1.558E+4
6.250E+1        2.000E+0        9.396E+4        2.557E+5        6.136E+3
6.750E+1        2.000E+0        9.396E+4        3.221E+5        7.157E+3
7.250E+1        4.000E+0        1.879E+5        7.981E+5        1.651E+4
7.750E+1        3.000E+0        1.409E+5        7.312E+5        1.415E+4
8.250E+1        6.000E+0        2.819E+5        1.764E+6        3.287E+4
8.750E+1        9.000E+0        4.228E+5        3.157E+6        5.412E+4
9.250E+1        6.000E+0        2.819E+5        2.486E+6        4.032E+4
9.750E+1        1.100E+1        5.168E+5        5.338E+6        8.213E+4
```

樣品及偵測資訊

Size

Concentration

Header

Linear values

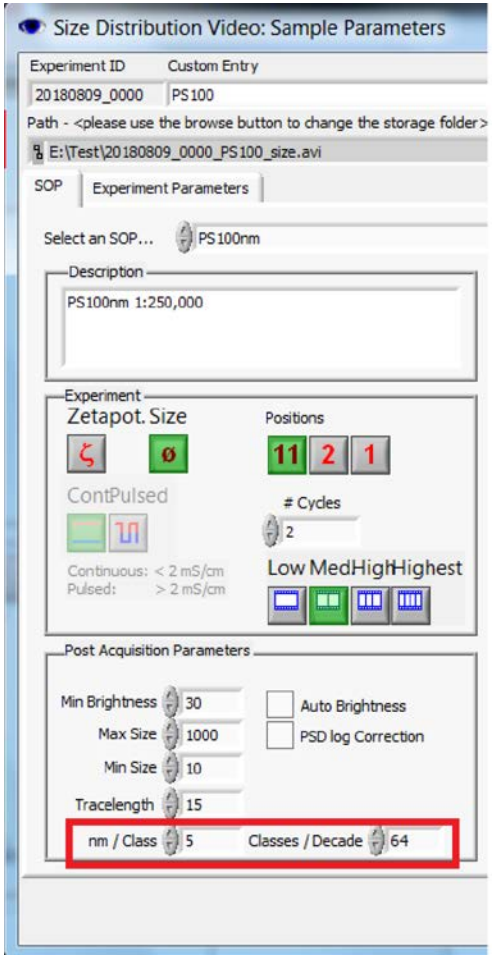
5.958E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.962E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.968E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.972E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.978E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.982E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.988E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.992E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.998E+3	0.000E+0	0.000E+0	0.000E+0	0.000E+0
-1.000E+0	-1.000E+0	-1.000E+0	-1.000E+0	0.000E+0
4.683E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
4.855E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.033E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.217E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.408E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.607E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
5.812E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
6.025E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0
6.246E+0	0.000E+0	0.000E+0	0.000E+0	0.000E+0

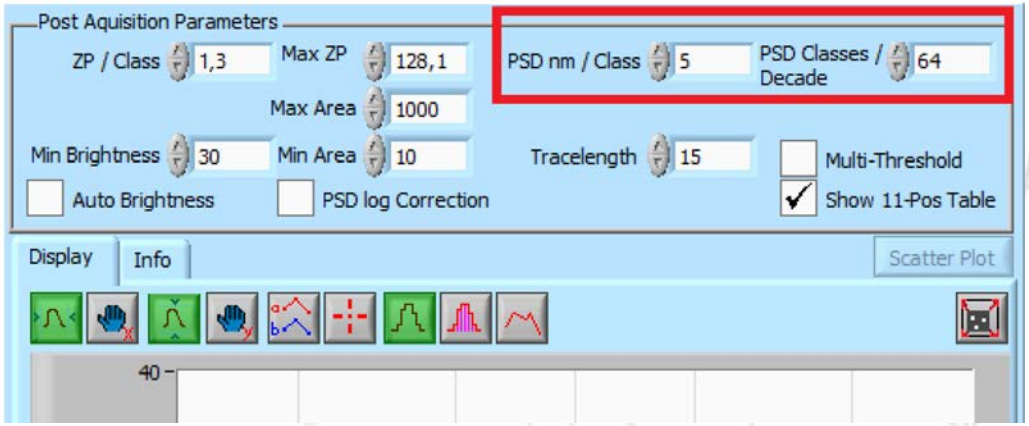
Linear Values

Separator

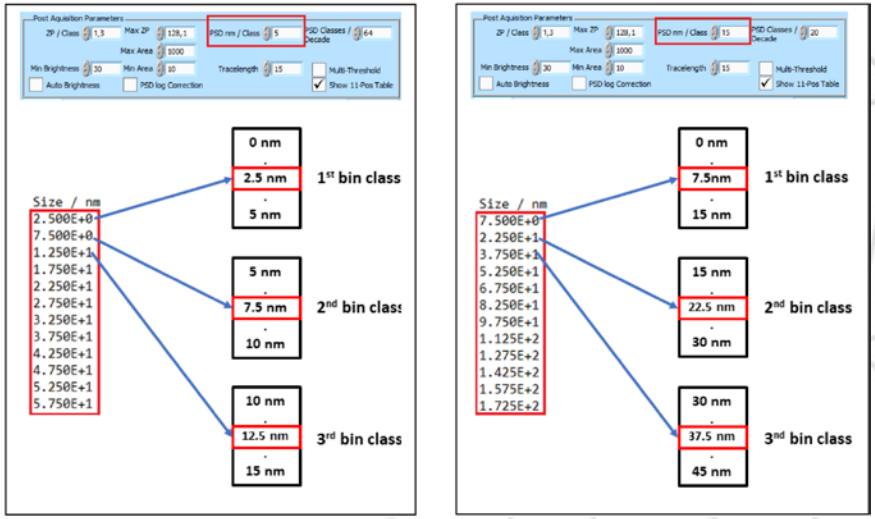
Logarithmic Values

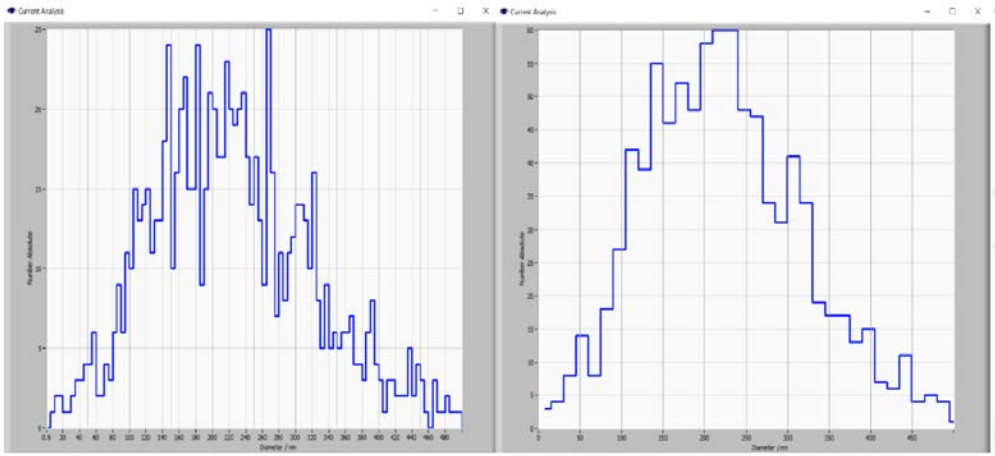
Class Width


Size Distribution Video: Sample Parameters
Experiment ID
Custom Entry
20180809_0000
PS100
Path - <please use the browse button to change the storage folder>
E:\Test\20180809_0000_PS100_size.avi
SOP
Experiment Parameters
Select an SOP...
PS100nm
Description
PS100nm 1:250,000
Experiment
Zetapot. Size
Positions
11
2
1
ContPulsed
Cycles
2
Continuous: < 2 mS/cm
Pulsed: > 2 mS/cm
Low MedHighHighest
Post Acquisition Parameters
Min Brightness
30
Auto Brightness
Max Size
1000
PSD log Correction
Min Size
10
Tracelength
15
nm / Class
5
Classes / Decade
64


Post Aquisition Parameters
ZP / Class
1,3
Max ZP
128,1
PSD nm / Class
5
PSD Classes / Decade
64
Max Area
1000
Min Brightness
30
Min Area
10
Tracelength
15
Multi-Threshold
Auto Brightness
PSD log Correction
Show 11-Pos Table
Display
Info
Scatter Plot
40

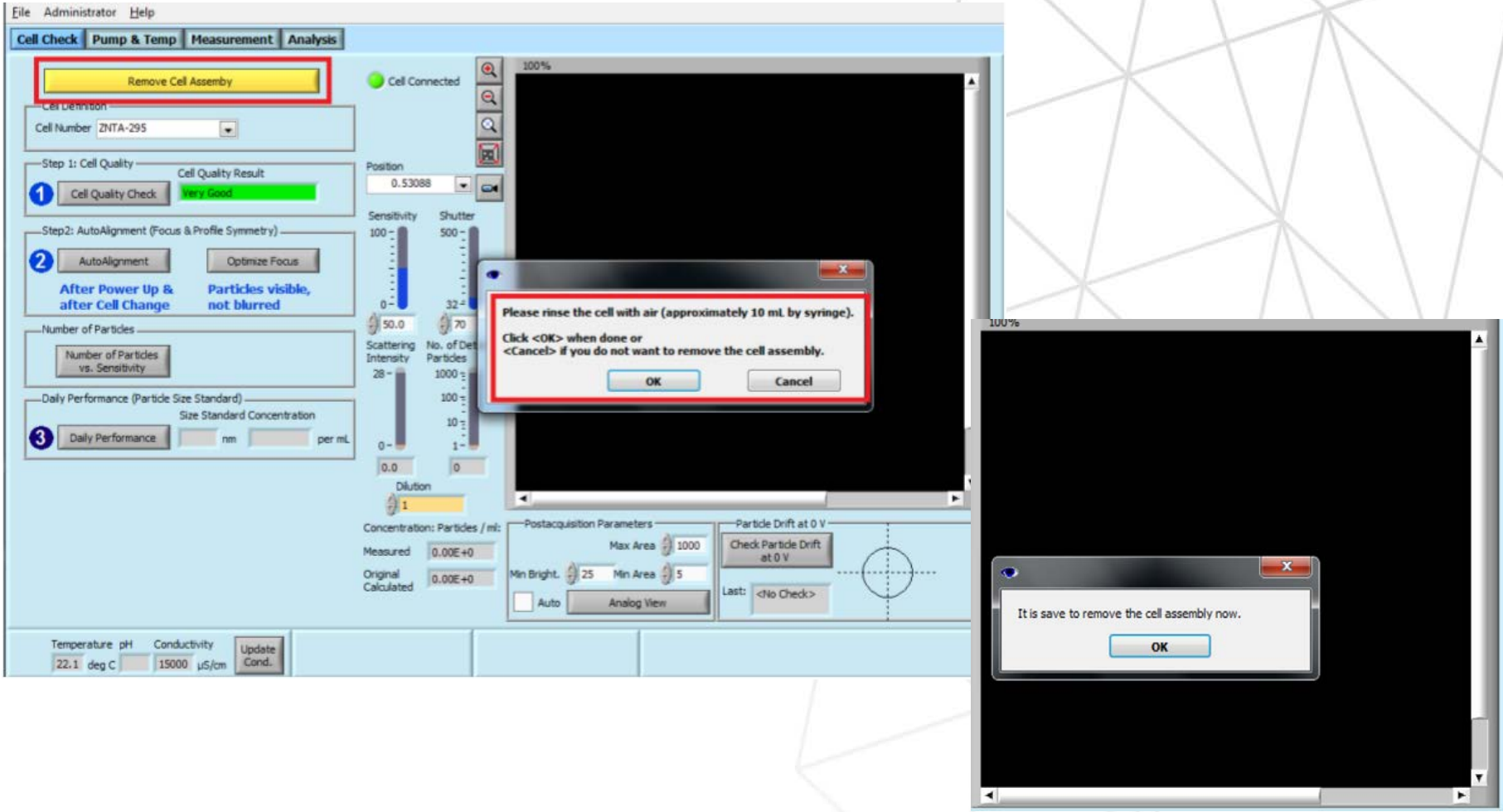
Class Width - Linear Value





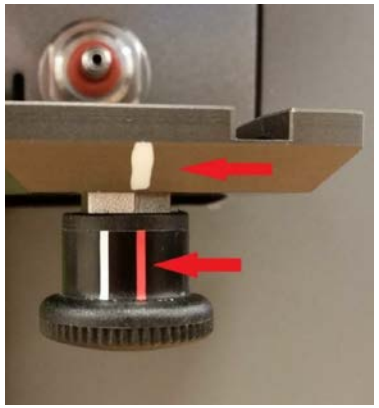
Cleaning and Flushing the Measuring Cell

Remove Cell Assembly - 1



Remove Cell Assembly - 2

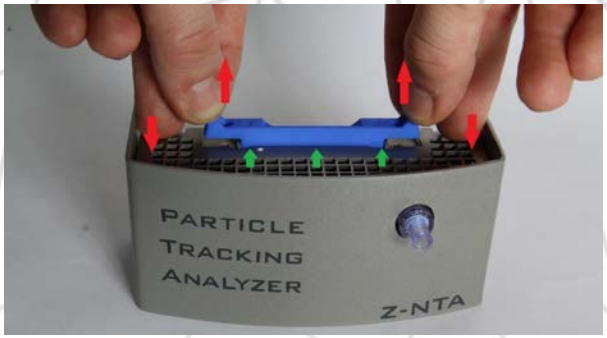
1. Unlock position



2. Remove both screws



3. Pull the cell carrier



4. Insert the wet brush



Preventing Maintenance and Service

Maintenance: Every half year

Pump head exchanged: Every year

Education: Depends

Contact ：李佳玟 shelly@unimed.com.tw
02-27202215 # 212

Discussion

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