NOTICE MEB ZEISS PTA

To observe several parameters can be modified

- Choise of detector / brightness and contrast
- Mix two detectors
- Make 2 signals , 2 pictures
- Working distance (WD)
- Voltage : EHT
- Change diaphragm (increase the current)
-

Paramètre à modifier

- Focus (WD) - Wobble - Magnification - Contrast and brightness
- Reduce the area of the inspection window - Astigmatisme

ONLY AFTER A SPECIFIC TRAINING

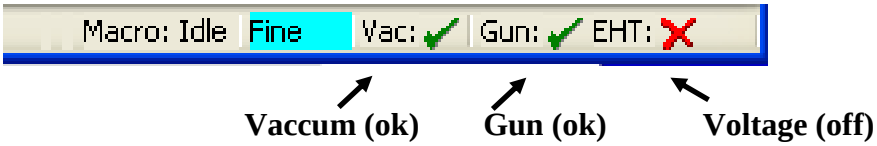
1°/ OPENING SESSION :

Run the software SMART SEM USER, put the name and password (user / user)

1/ Check:

- Check that the vacuum.(green)

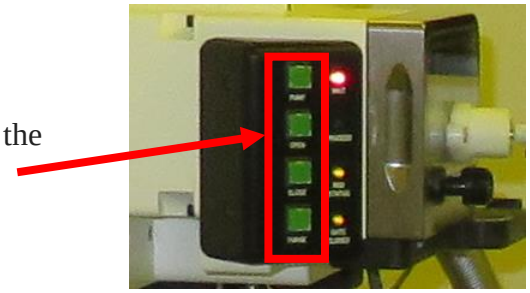
- Check the gun is green



If the gun is not "ON" , call PTA

2°/ PUT THE SAMPLE IN THE SAS

The 4 LEDs must be off at the beginning and at the end of the load



PROCEDURE A :

1/ On the keyboard launch EXCHANGE

- Open the SAS , Fix the sample on the slide and verify that the sample does not fall.
- Secure the rod with the black knob , « rob status » light.

If « rob status » is flashing the sen is blocked

- Put the vacuum , press **« PUMP » (on)** (the stage moves to position exchange)
- **« PROCEED »** is light, open the valve between the SAS and the chamber, and click «OPEN» (on)
- **Screw rod** and push rod inside the microscope chamber
- Unscrew the rod and remove the cane , fix the cane
- **«OPEN» (off) , « CLOSE » (on) , « PUMP » (off)**
- Wait , **« GATE CLOSED »** must be light
- **After launch the second step (resume)**

2/ On the keyboard launch RESUME

- Press **« PUMP » (off)**
- Press **« CLOSE » (off)**
- Press **« PURGE » (on)** (ventilation of the SAS)
- Wait 20 s , Press « PURGE » (off)

PROCEDURE B (à utiliser en priorité)

If « rob status » is flashing the sen is blocked

1/ Lancer la **MACRO 1** de chargement

- click **the left mouse button on**  . Follow directions

2/ Lancer la **MACRO 2** de fin de chargement et ventilation du sas.

- click **the right mouse button on**  . Follow directions:

If you have validated the wrong macro, validate the messages and restart the macro.

3°/ USE OF THE MICROSCOPE

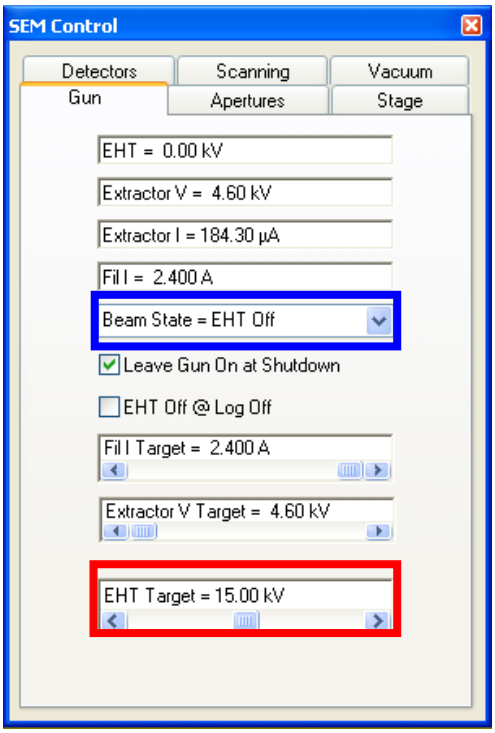
3.1 - PUT VOLTAGE :

Several solutions

1°/

Click « EHT » put « EHT ON »

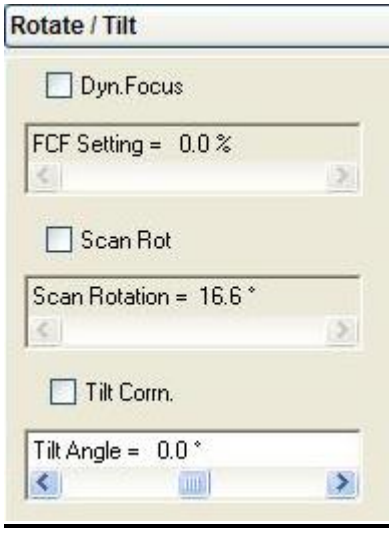
2°/



you can select « EHT ON » ●

Change voltage ●

Unselect the box : (dyn focus / scan rot / tilt comn)



Determination of the sensibility of thumb wheels

Select **FINE** or **COARSE** for sensitivity by clicking or pressing the **TAB** key

4°/ OBSERVATION

4.1 – Choice of detector / contrast and brightness

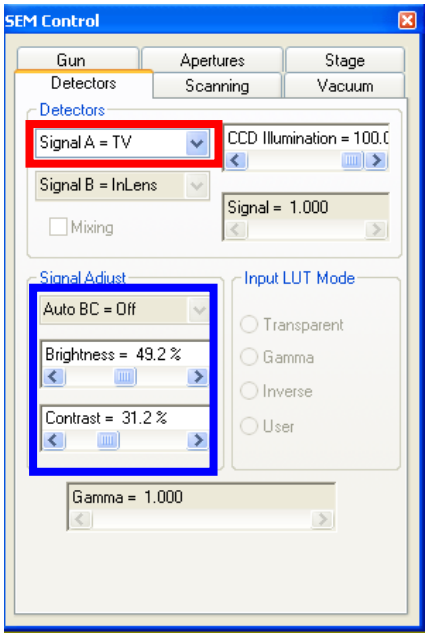
Choice of detector : ●
Several possibilities

Signal A = TV
Grand. = 30 X
EHT = 0.00 kV
WD = 1.1 mm

On the keyboard « **CAMERA** », switch to TV signal

camera / détecteur

Choice contrast / brightness: ●
Automatique = BC
Manuel = auto vidéo = OFF



Type de détecteur

SE2	WD > 5 mm , Working with secondary electrons (+ topographic)
InLens	WD < 15 mm , working with secondary electrons

4.1.1 - Mixing signal scan be executed

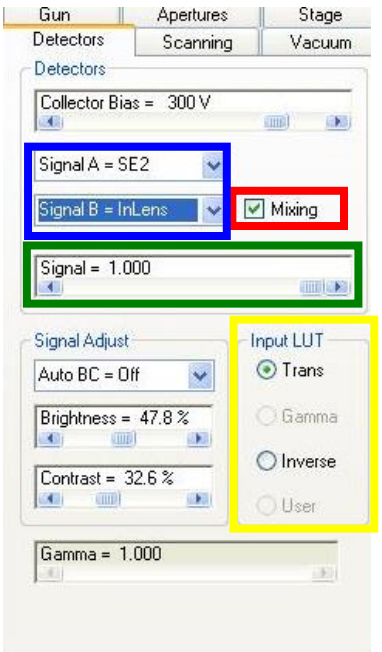
check the box « Mixing » : ●

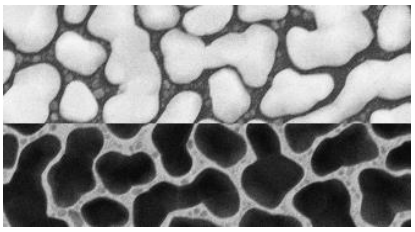
Select détecteur ●
Select a different detector on each signal (signal A et signal B)

in Signal ● if signal = 1.000 ➔ Signal A = 100%
if signal = 0.000 ➔ Signal B = 100%

dans « INPUT LUT » ●, select trans ou inverse the signal is inverted: le « INPUT LUT » trans is the standard

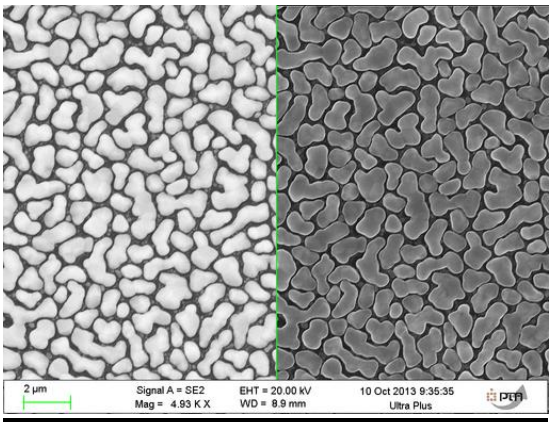
Restoring "trans" after use

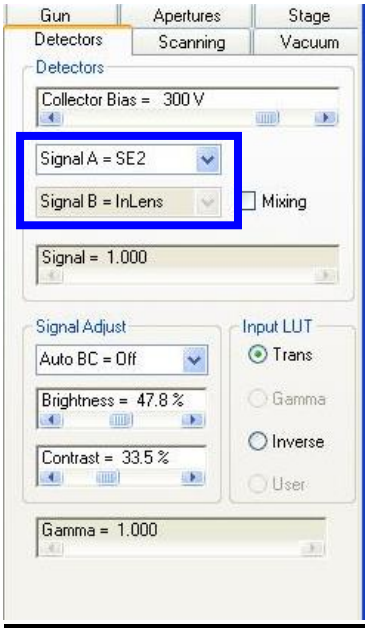




4.1.2 - Make 2 signals , 2 pictures

Click  and select detector ●





The icon  allows to change the detector

4.2 - Tension : EHT

Modification

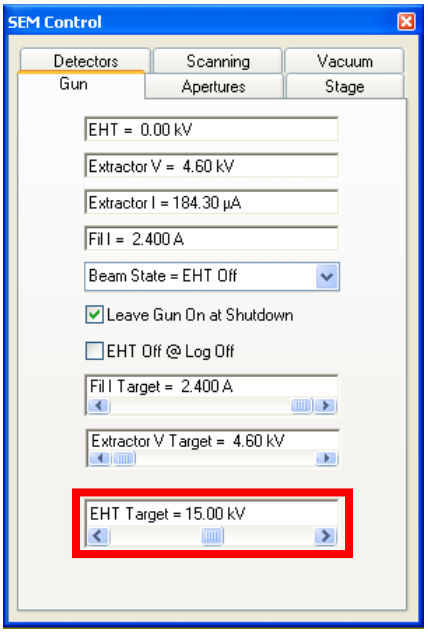
Signal A = SE2 EHT = 5.00 kV
Mag = 20.57 K X WD = 13.4 mm

- If the sample contains low atomic number elements, it is necessary to reduce voltage

- We must reduce the voltage to avoid damaging the sample.

- When we have non-magnetic samples , we must work at low voltage 2 / 3 Kv

You can vary the tension between 2 Kv and 20 Kv

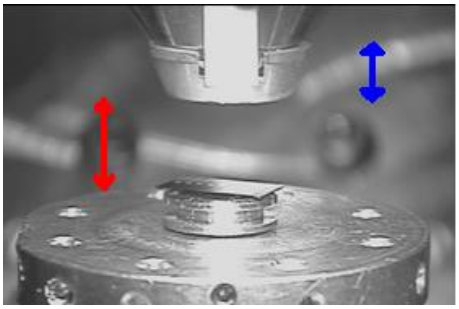


4.3 - Working Distance : (WD)

When one increases the working distance, depth of field increases

Must increase the tension

● = Distance entre 4 / 5 mm
● = WD (focus)



4.4 – Changement de diaphragme / augmentation courant

Change diaphragm ●

the diaphragm is reduced, it reduces the current

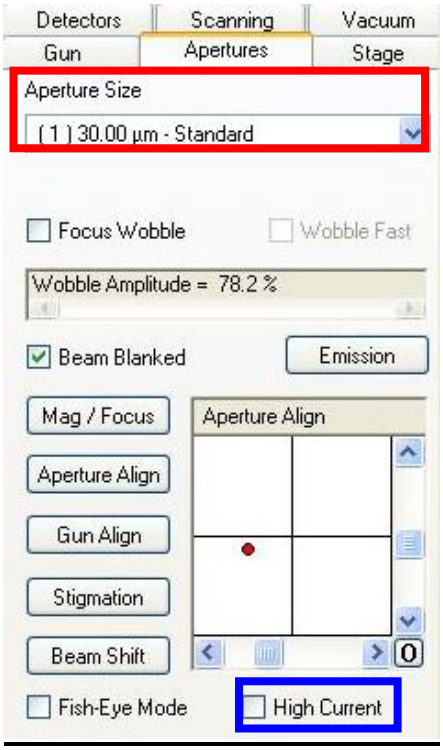
We can double the current , check « **High Current** » ●

To increase the contrast, the signal must be increased, so change the diaphragm (30 µm → 60 µm).

diaphragms smaller than 30µm: the depth of field is increased at the expense of the resolution.

diaphragms larger than 60µm : the resolution is improved.

Diaphragme 30µm is the most used



Note : Degaussing coils
SHIFT F2

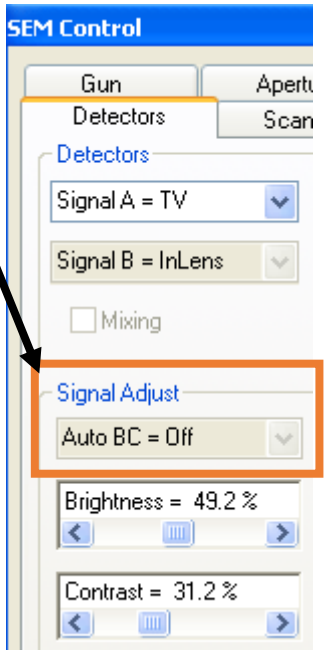
5°/ IMAGE ENHANCEMENT

5.1 - Parameter to be modified

- Wobble
- Grossissement
- Astigmatisme
- Focus (WD)
- Brightness / contrast

Brightness / contrast

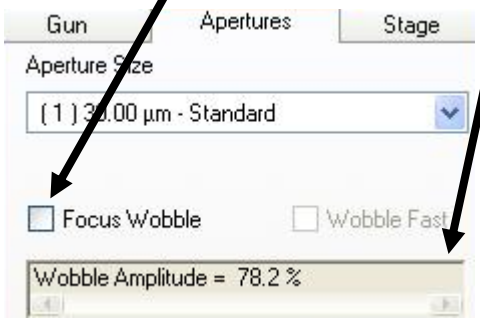
Waning Brightness / contrast can be modified with the 2 buttons if « signal Adjust » is « OFF »

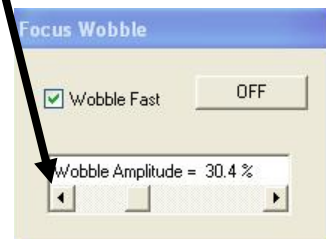


Wobble

Press the keypad button to activate it
or
Clic on « focus wobble »

For the "WOBBLE", you can change the amplitude from 20% to 30%





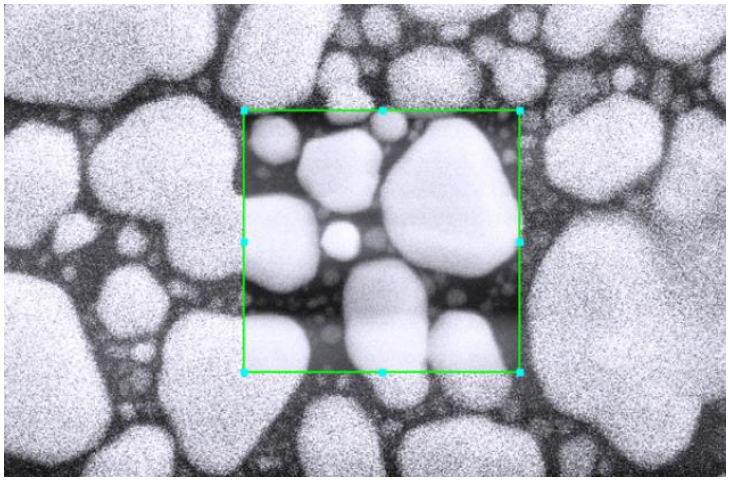
5.2 - Réglage

Parameter settings are wobble, focus, stigmatism

Reduction of the observation window

Make a reduction of the observation window to adjust the settings (scanning speed 2)

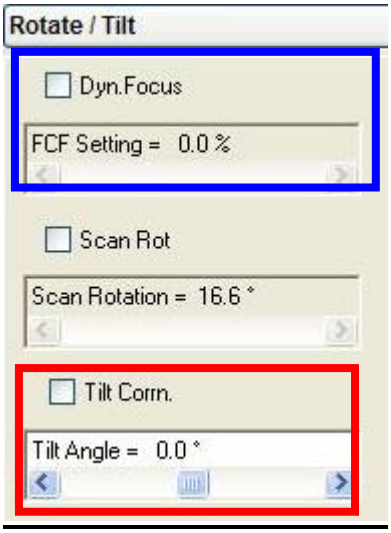
Réduction



TILT : image correction

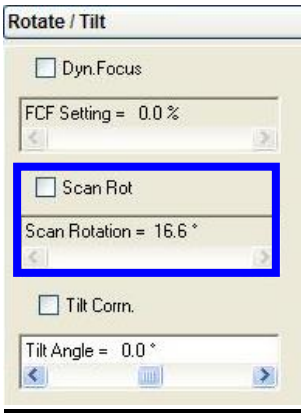
* Make a dynamic correction
  - Open a small windows
  - Make the focus to the middle of the image **(Speed2)**
  - Put the small windows at the top of the image
  - Check « dyn. focus » (put 0)
  - Apply « setting FCF » see the better picture (don't touch the focus adjustment)
  - Switch to the big screen , the correction is made

* Make a tilt correction
  - check « corrn inclinaison »
  - indicate the angle of inclination



Computer image rotation

We can rotate the image by pressing the button and turning or click **« Scan Rot »**



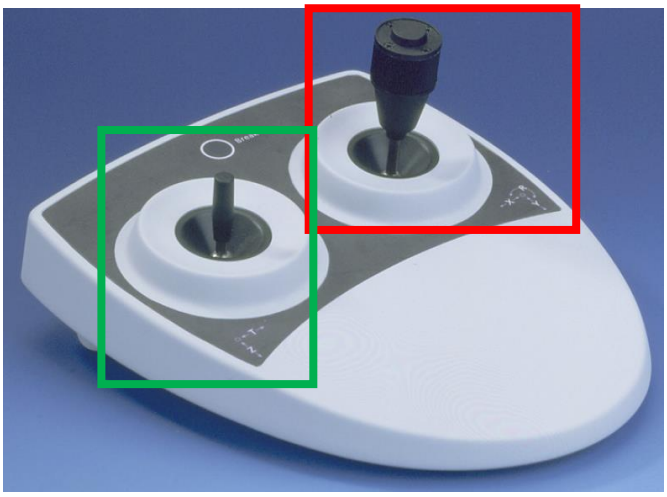
6°/ DEPLACEMENT DE LA PLATINE (échantillon)

6.1 – Déplacement de la platine avec le joystick

X = Move in X
Y = Move in Y
R = Rotation

T = tilt (incline)
- Right + 60°
- Left 5° max

Z = Up or Down samples



6.2 - DISPLACEMENT OF THE STAGE :

6.2.1 – Move stage

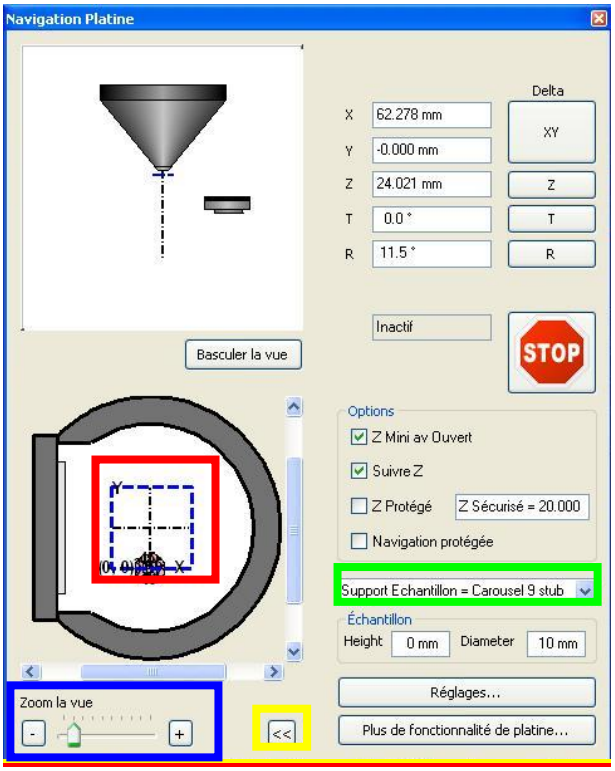
click on the stage ●

We can zoom ●

Selects stage ●

Click here ● to enlarge the windows

CRL + Tab *provides a cross and then moves the mouse*



6.2.2 – toolbar

Left click = center image	With the mouse 	Right click = center and zoom the image « right click, left click (don't let go) , and move the window»

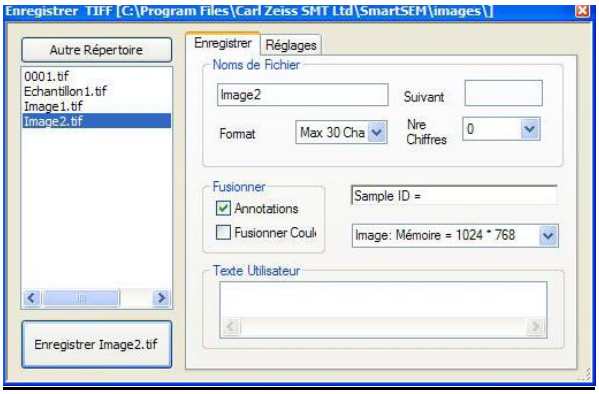
We can initialize the navigation platine go to "STAGE" then "STAGE BOOTS" in the main menu

7°/ MAKE A PHOTO

3 Speeds are already determined 

Save pictures

In the toolbar select **« file »**, **« Save picture »**



You can change :
registre
File names
Number (>0)

Clic  to save the next images
OU
To save the photo to position the mouse over the image and click the right button. A menu appears and select : **Send To… / Tiff file .** To name the photo and increment

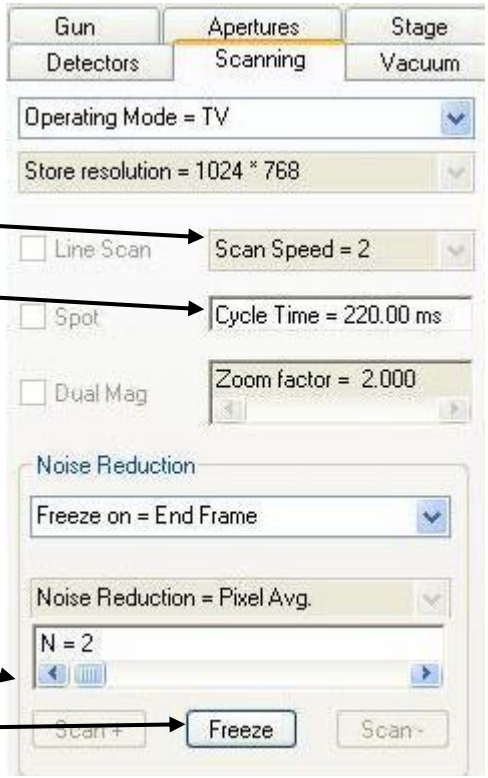


Image revolution

choice of scanning speed

Cycle time

Option to reduce the image noise

Number pictures

Option to stop the photo Or keyboard (freeze)

The photo is being acquired an orange circle ● appears in the bottom right of the screen and when the picture is complete it turns red ●
When closing the window for registration, the image remains fixed but the red circle turns blue ●.

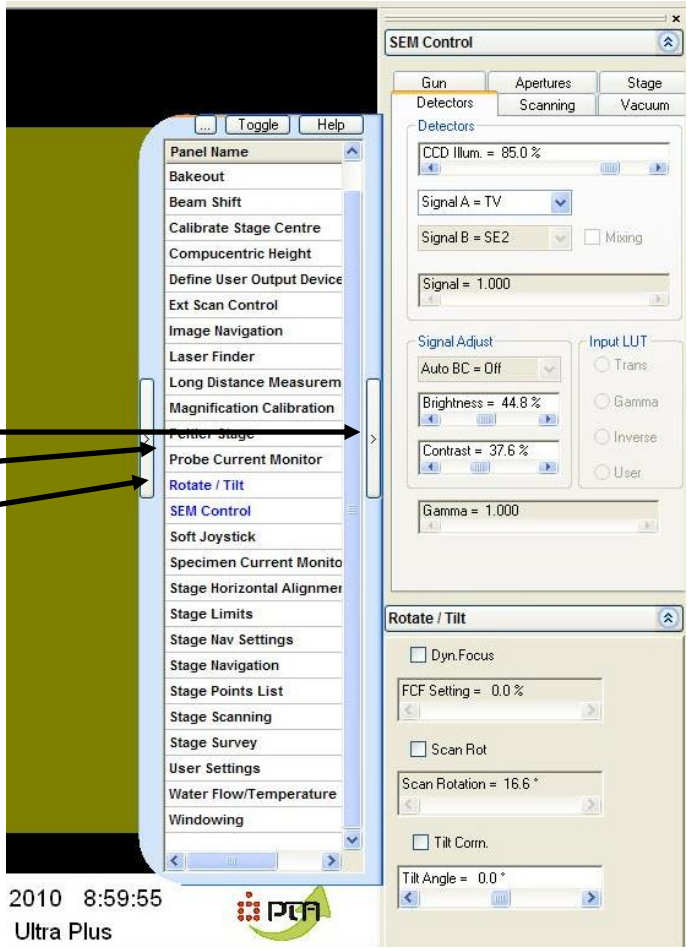
Make **freeze** to take a pictures  or keyboard

8°/ OTHER

click here for open or close windows

see page 7

see page 4



9°/ ANNOTATIONS

	Save the annotation as user annotation
	Deletes all visible annotation
	Adds a text the user can enter
	Adds a horizontal bar which indicates the size of an objet in the image.
	Adds a horizontal bar which indicates the size of an objet in the image. Fixed dimension
	Allows you to measure the size of a certain feature
	Allows you to measure an angle between two objets
	The linewidth measurement facility is a rectangle which may be ajusted in height , width , angle
	The radial measurement facility is a circle which may be adjusted in diameter
	Comprises a related pair of vertical lines
	Comprises a related pair of horizontal lines
	Comprises a related pair of vertical lines , length and position
	Comprises a related pair of horizontal lines , length and position

Différentes Icones

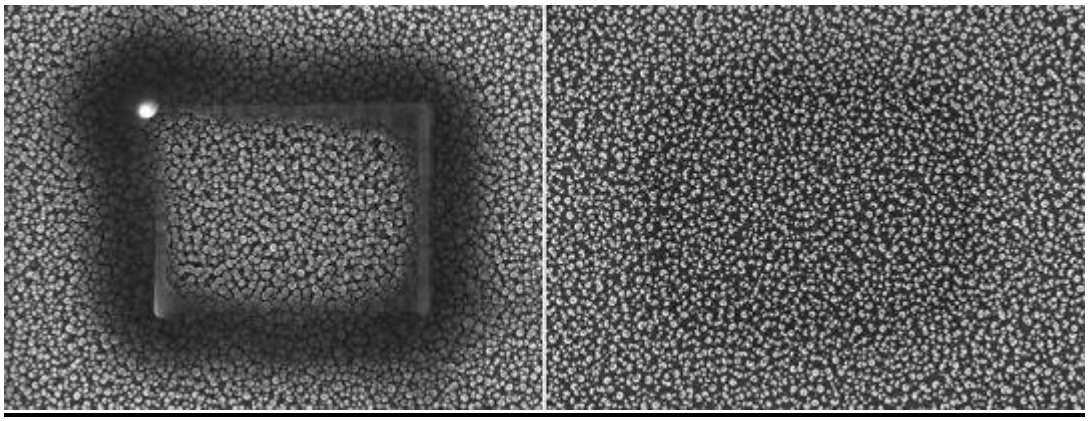
	Load / Unload sample
	Change speed
	Change windows
	Choice of detector: SE2 / Inlens
	2 scream with a different detector
	Save picture
	Left click = center image Right click = center and zoom the image « left click, right click, and move the window»

AFTER MAKING SPECIFIC TRAINING

10 : Evactron

Allows the removal of residual hydrocarbons in the vacuum

- Cut EHT , « EHT off »
- Select « Vent » (vide 1.10-1)
- Turn on
    - Select time
- Put pump
- The evactron is running (vide 4.10-1) et will shut off all alone
- Turn on high voltage and examine your sample



11 : Gaz injector

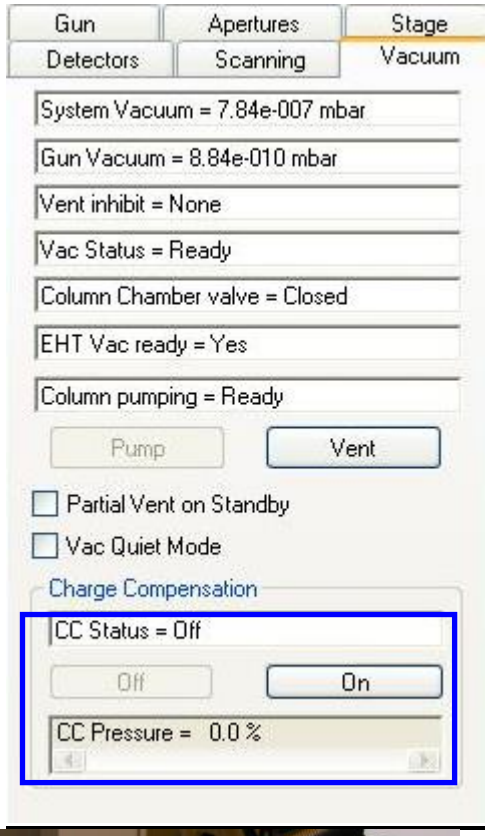
Use injector

- in vacuum

- Down the sample (the sample should not be tilted)

- clic « ON »
  - The sample will be put in a position 0
  - The gas injector will advance (very brutal)

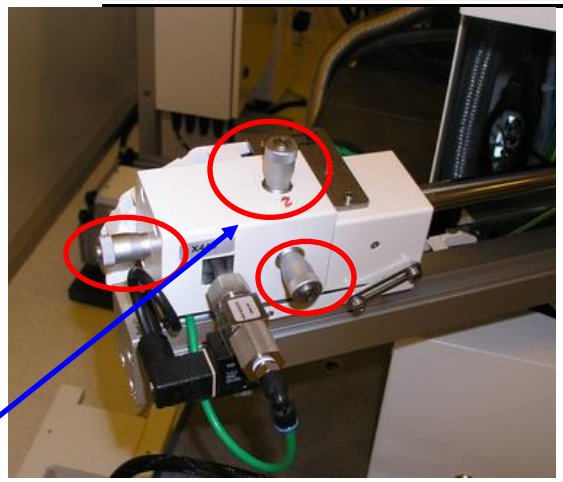
- Adjust « CC Pressure = 0.0% » à 100% (usally)



Adjusting the position of the injector

use the 3 mollettes for adjust injector

the injector must be ready to sample



End user

- Put « CC Pressure » à 0.0%
- Down (≈1cm) injector using Z

Clic « OFF »