

MEB : EDX

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Working distance : $6 < WD < 7$
Voltage : **3 Kv à 20 Kv**
The dead time must be less than à 30%

Optimal excitation is obtained for an incident energy of about 1.5 to 2 times the energy of the emission line

SOFT : esprit / esprit1

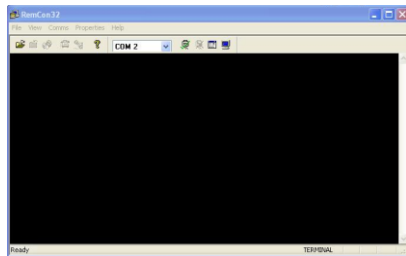
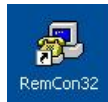
To identify the elements Make an identification at 20 kV to have the lines at high energy (OBJECT measurement)

1° Start-up of the EDX :

1.1/ Communicating EDX with the SEM: Launching the SEM software

Normally the RemCon32 program is already open

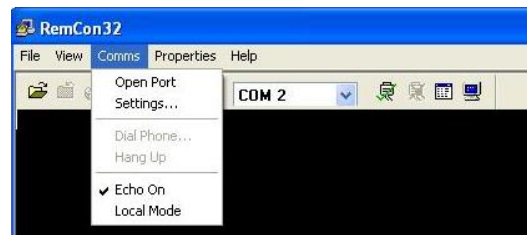
1°/ Clic on



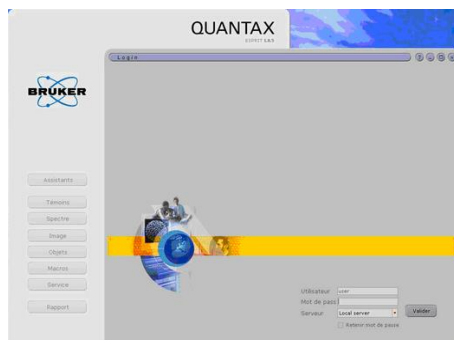
2°/ Clic on « COMMS »
Sélect « COM2 »

- if « OPEN PORT », To pass in « CLOSE PORT » Clic on « OPEN PORT »

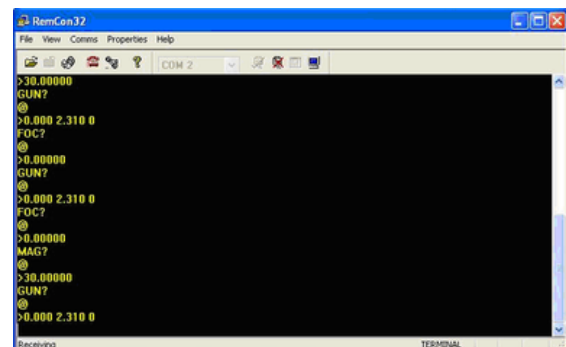
- If « CLOSE PORT », do nothing



3°/ Lauch the software « EXPRIT 1.8 »



Compte : USER
No password



SEM communicate with EDX

1.2 / Create a new project :

Create a new project

Save the project



2°/ Applicable to any type of measurement

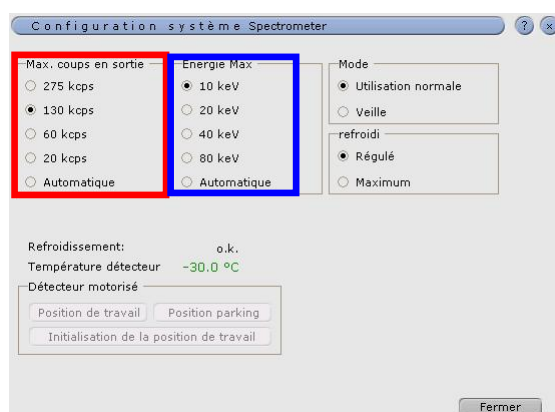
A/ Setting of measurement and display parameters

The dead time must be less than 30% but the most ready (parameter to be adjusted in the spectrometer)

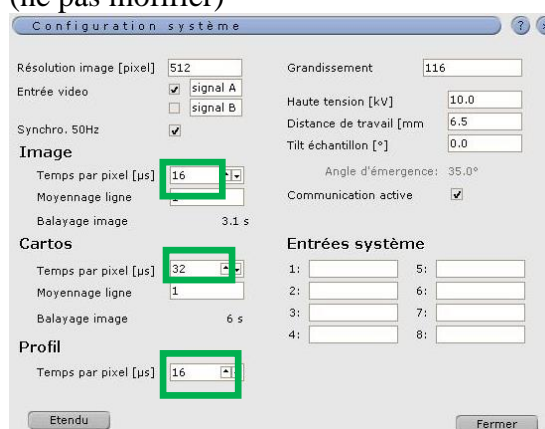
Lets have the most information

Spectrometer	Entrée	10.4 kcps	Gamme	10 keV / 130 kcps	Temps mort	0 %
imagerie, MEB	Résolution	512 x 384	HT	10.0 kV	Grandissement	116 WD 6.5 mm

Spectromètre



Imagerie, MEB (ne pas modifier)



Paramètre de base

Carto / profil : temps de pixel (µs) = 256
Image : temps de pixel (µs) = 32

To change the dead time change the **Max. coup en sortie**

Max. coup en sortie

Mode standard = 130 kcps

	Cst temps
20 kcps	3 µs
60 kcps	2 µs
130 kcps	1 µs
275 kcps	0.5 µs

à 275 kcps = less noise, wider peak, less resolution

Energie max

	Résolution
10 Kev	2,5 Ev/canal
20 Kev	5 Ev/canal (très basse énergie)
40 Kev	10 Ev/canal
80 Kev	20 Ev/canal (inutile)

= 40 Kev en standard ou 20 Kev (plus de résolution)

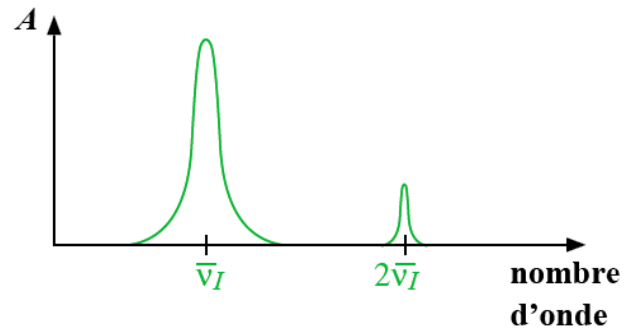
Le spectre est de 4096 canaux

B/ Parametres / Probleme

Attention aux artefacts :

C'est une mesure de 2 événements en même temps

C'est 2 fois la tension d'un pics



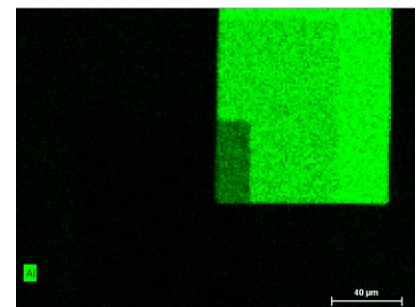
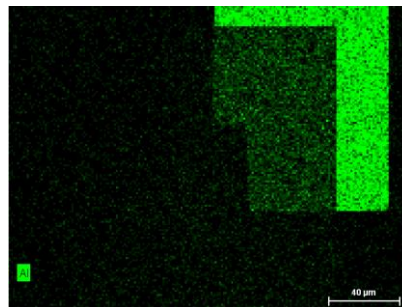
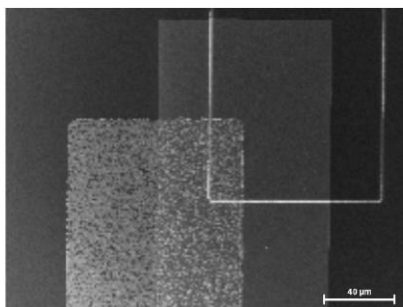
Voltage : ↗

difference layer / materials: ↘

Depth layer : ↗

5 Kv 30μ 40 Kev 130 kcps : 9min

20 Kv 30μ 40 Kev 130 kcps : 9min



Diaphragme : ↗

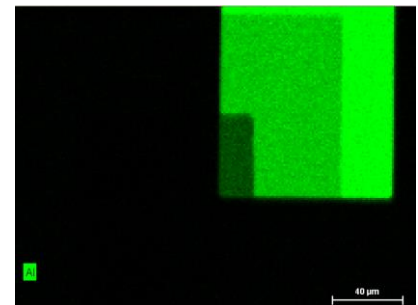
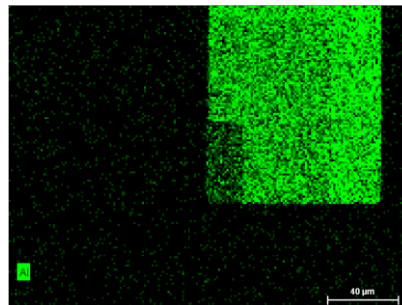
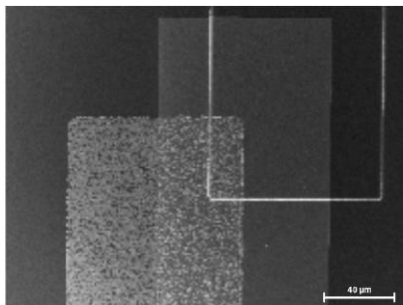
Time : ↘

Information : ↗

Nb coup : ↗

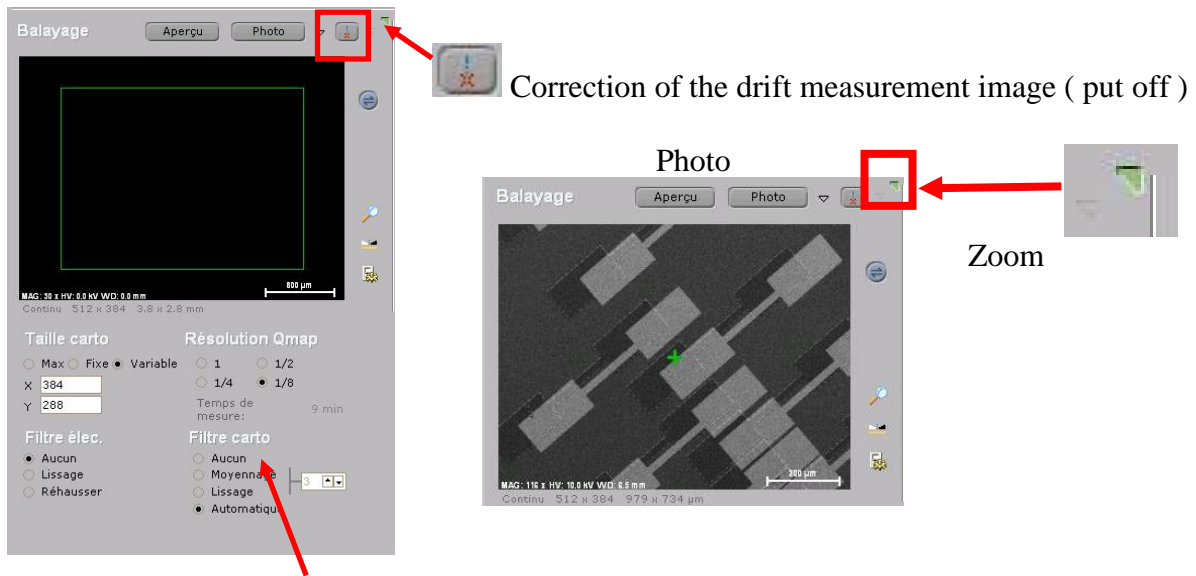
15 Kv 10μ 40 Kev 130 kcps : 9min

15 Kv 120μ 40 Kev 130 kcps : 9min



3° / Scanning

Clic on « **Photo** », to obtain the picture

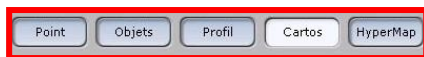
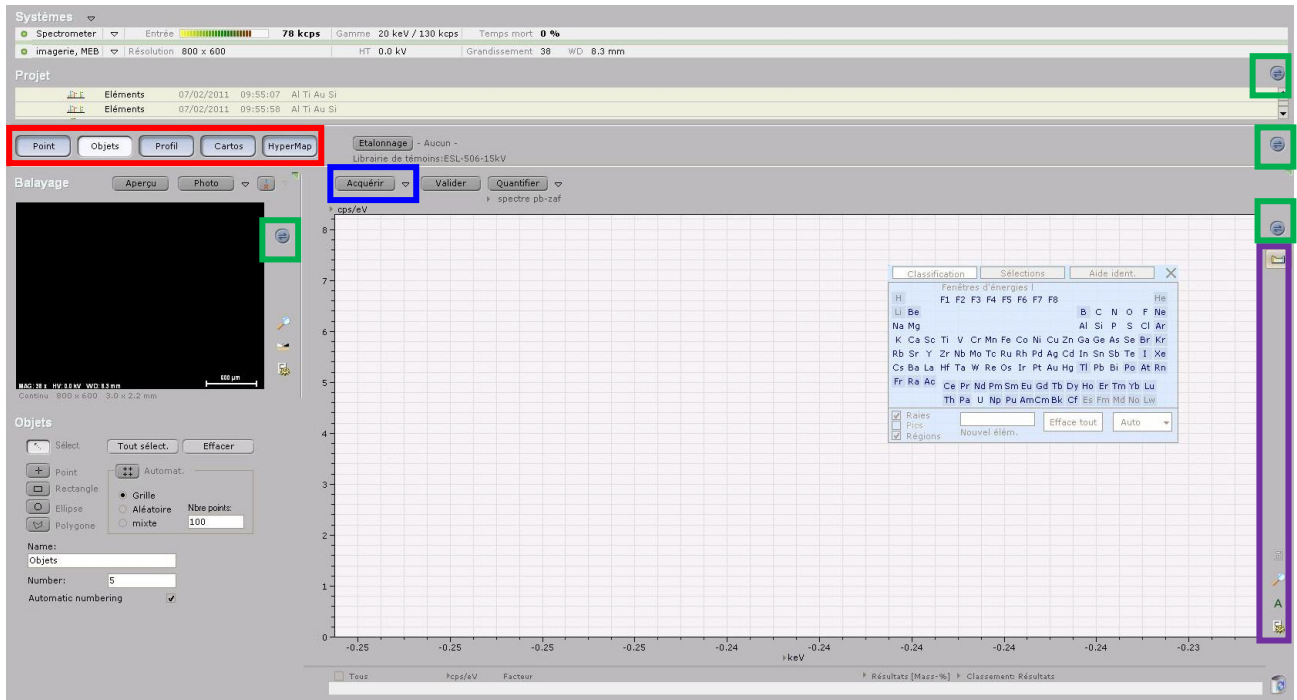


Dans « filtre carto », sélection « aucun »

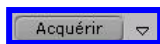


Change name and number

4°/ Partie mesure



Select measurement : Objet , Profil , Cartos



Launch measurement



Sauve



Analyze measurement

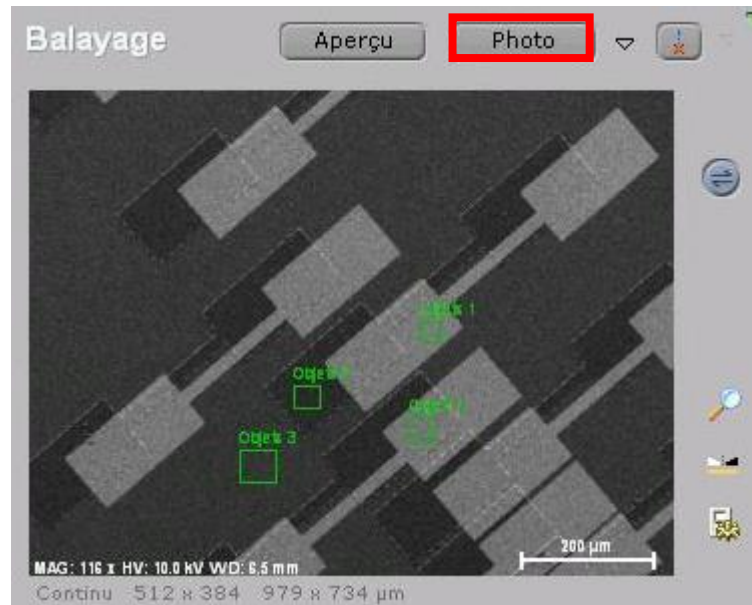
5°/ Mesure

Objets

5.1 – Make a picture

Clic on ●

In Objects select the areas to be measured ●

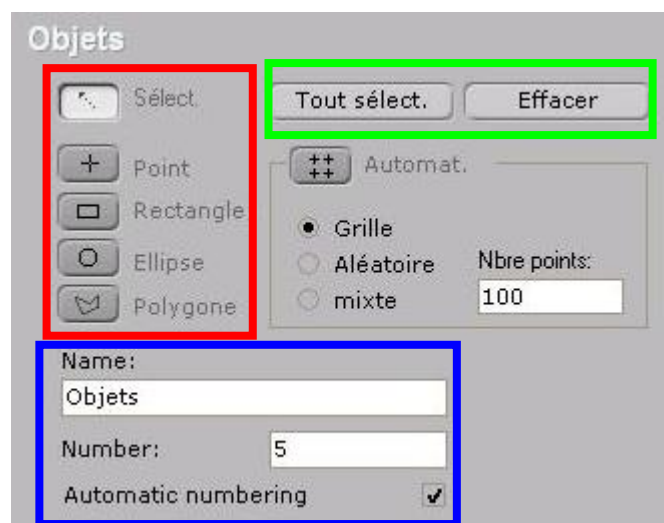


5.2 – points measures

select one or more points to be measured ●

Define name ●

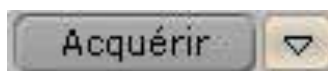
To acquire a measurement, select a point to be measured, or all of them if you have several « OBJETS » ●

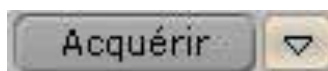


5.2 – Acquisition , parametres de mesures



to start the measurement

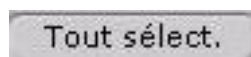
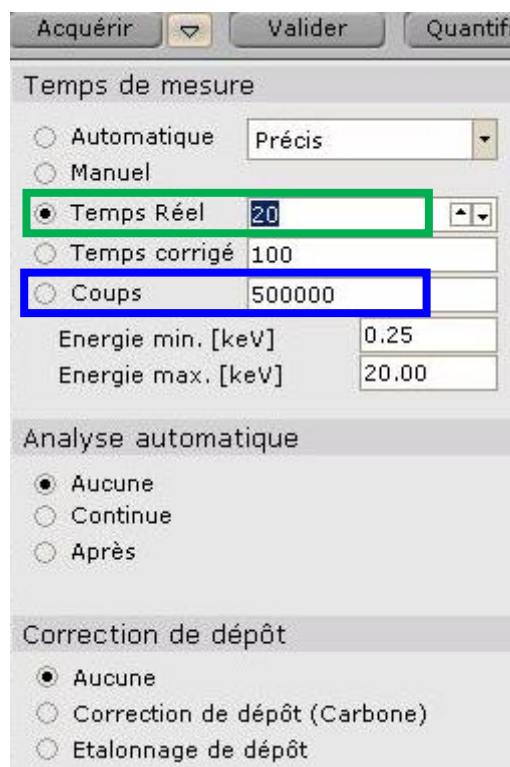


Click on  to change the measurement parameters

You can work in REAL TIME  or in number of Strokes 

Determine the parameters according to the desired resolution

Attention to measure on several points click on

Acquérir ▼ Valider Quantifier

Temps de mesure

☐ Automatique Précis ▼

☐ Manuel

☒ Temps Réel 20

☐ Temps corrigé 100

☐ Coups 500000

Energie min. [keV] 0.25

Energie max. [keV] 20.00

Analyse automatique

☒ Aucune

☐ Continue

☐ Après

Correction de dépôt

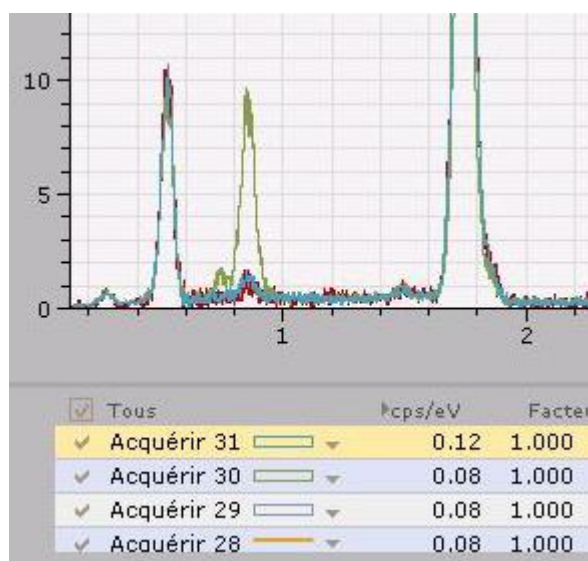
☒ Aucune

☐ Correction de dépôt (Carbone)

☐ Etalonnage de dépôt

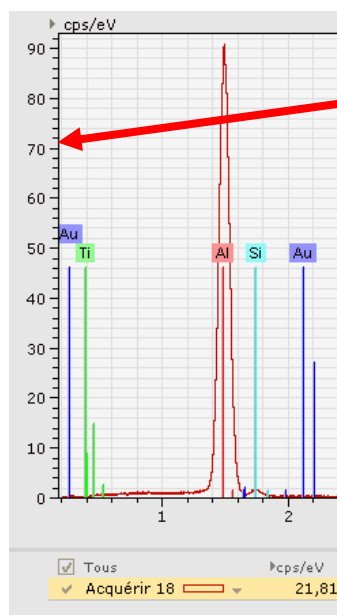
Once the measurements have been made

The materials for each measure must be identified.

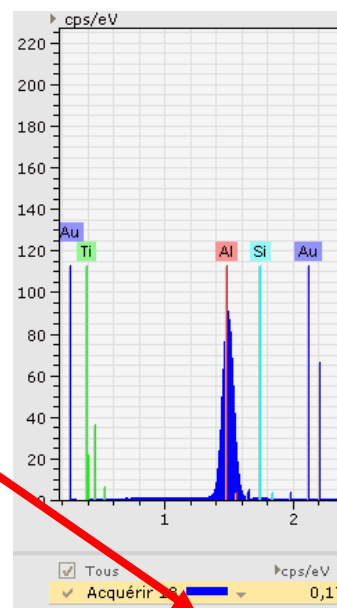


5.3 – Browsing for spectrum analysis

5.31 - Divers



Change of scale
- click on the scale and change the height

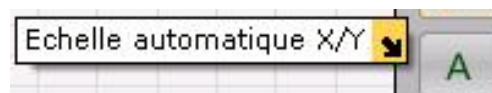
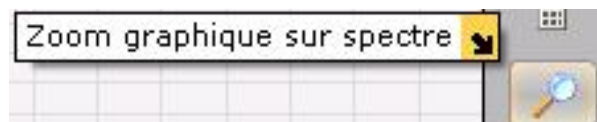


Color change and fill

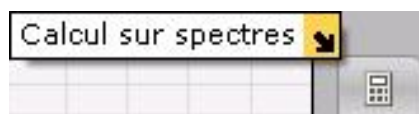
To see one or more spectra, check ●

Attention if the color is yellow the acquisition
Acquérir 31 the acquisition is displayed

<input checked="" type="checkbox"/>	Tous		cps/eV	Facteur
<input checked="" type="checkbox"/>	Acquérir 31	 	0.12	1.000
<input checked="" type="checkbox"/>	Acquérir 30	 	0.08	1.000
<input checked="" type="checkbox"/>	Acquérir 29	 	0.08	1.000



Allows you to put your purchase in the trash



Outils du spectre

Facteur: 1.000 * Acquérir 31

Somme ▼ 1.000 * Acquérir 31

= Acquérir 31+Acquérir 31



Options

Axe Y...

☐ Log

☐ Square root

☒ Echelle individuelle

☒ Automatique

Autres...

☒ Grille visible

☒ Bargraph

☐ Curseur XY

☐ Voir infos curseur

☒ Voir légende

☒ Echelle automatique au démarrage

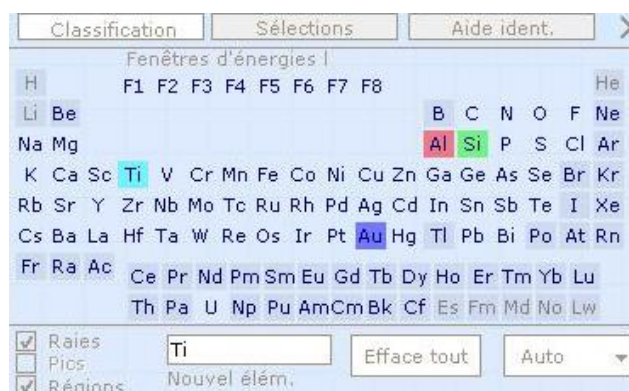
5.4 – Analyse

Clic on  to display the periodic table



We know the elements:

Select each item individually by clicking on it



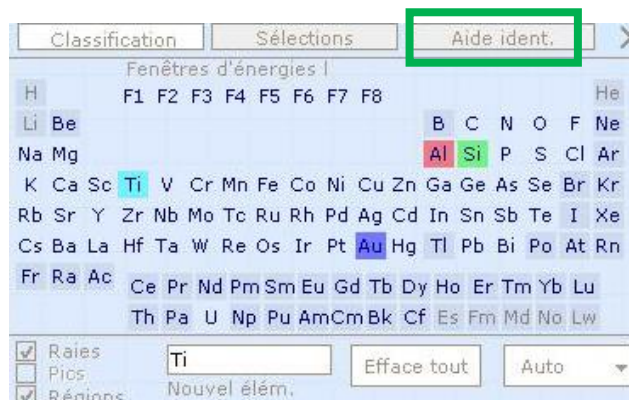
Manuel :

Clic on **AIDE IDENT.**



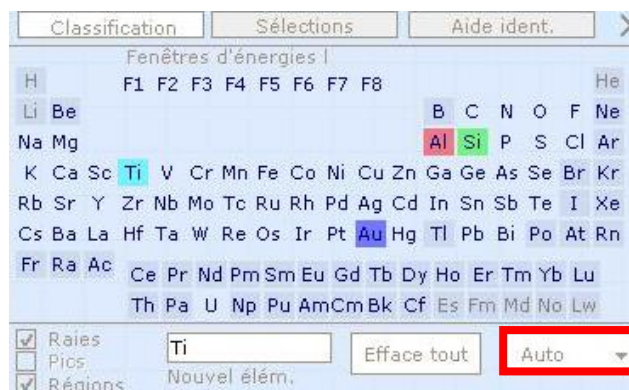
Move the black line on the peaks
or

Click on each peak of the most intense peaks and select the material that “suits” you (compare with the other lines)



Automatic:

- Click on **Auto** (beware of the results)
- If you want to limit the degrees of freedom of this search, click on the arrow to the right of "Auto",
in "Preset list + automatic" mode, you can systematically include elements (yellow), and for all "automatic" modes, exclude (pink), play on the sensitivity ("minimum concentration").



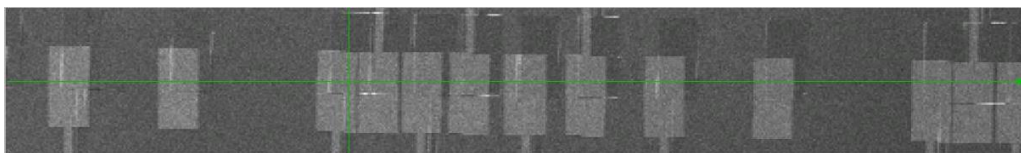
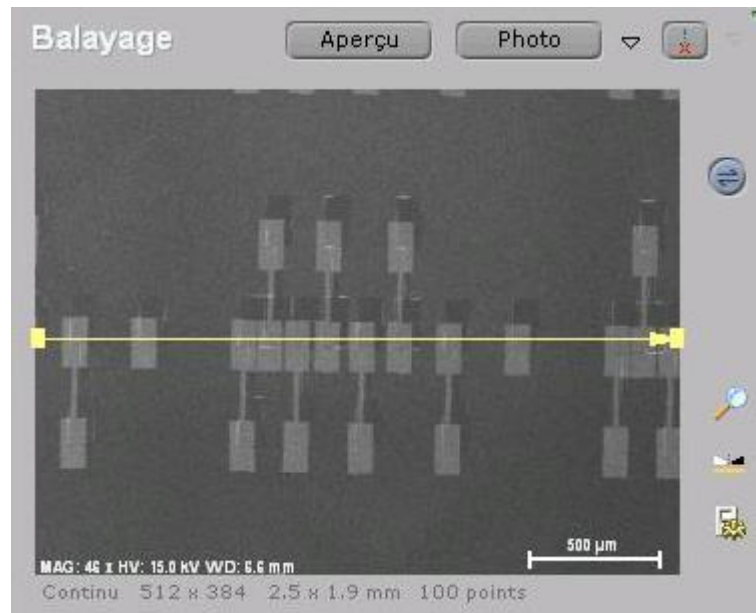
6°/ Mesure Profil

6.1 – Make a photo

The yellow arrow determines our measure

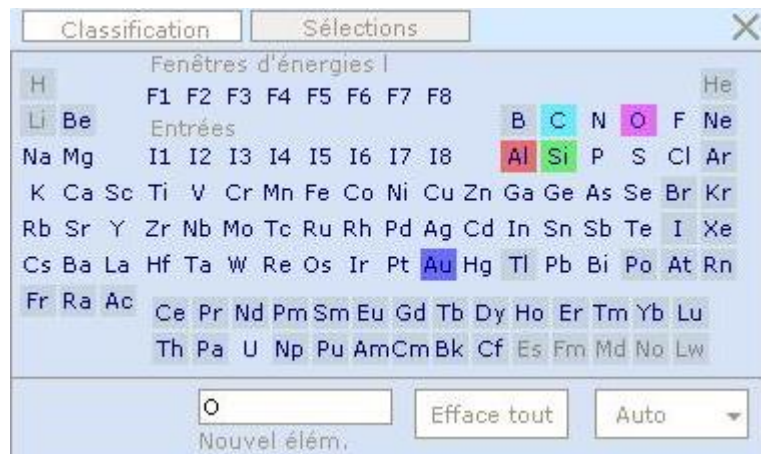
You can move it

She appears below



6.2 – Determine materials

For a faster analysis check your materials

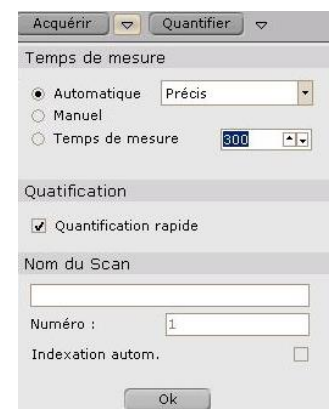
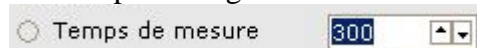


6.3 – Start your measurement

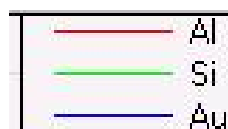
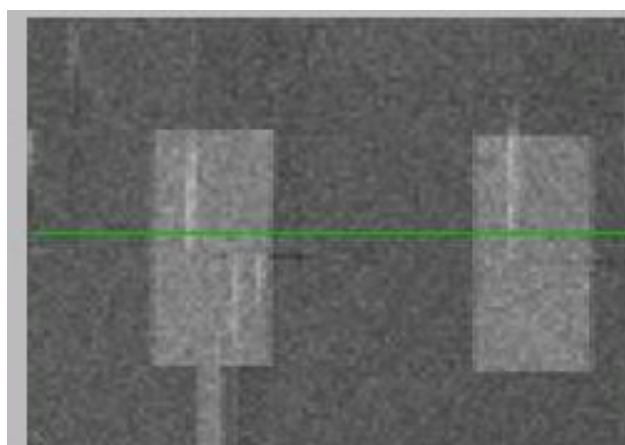
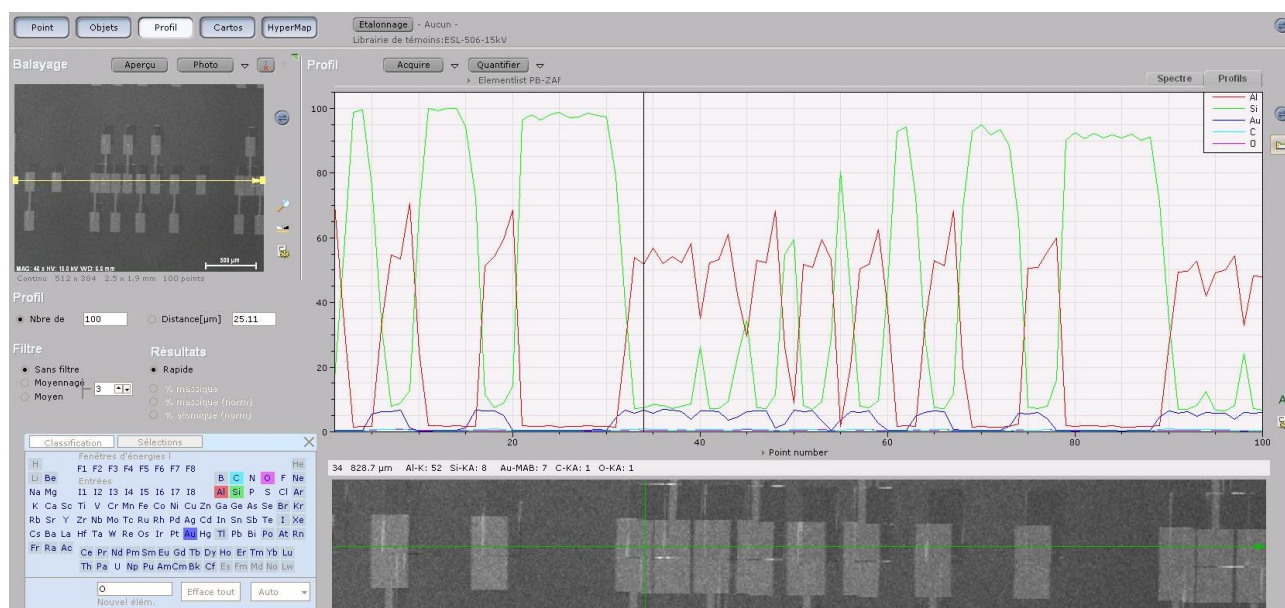
Click on to start the measurement

Click on to change the measurement parameters

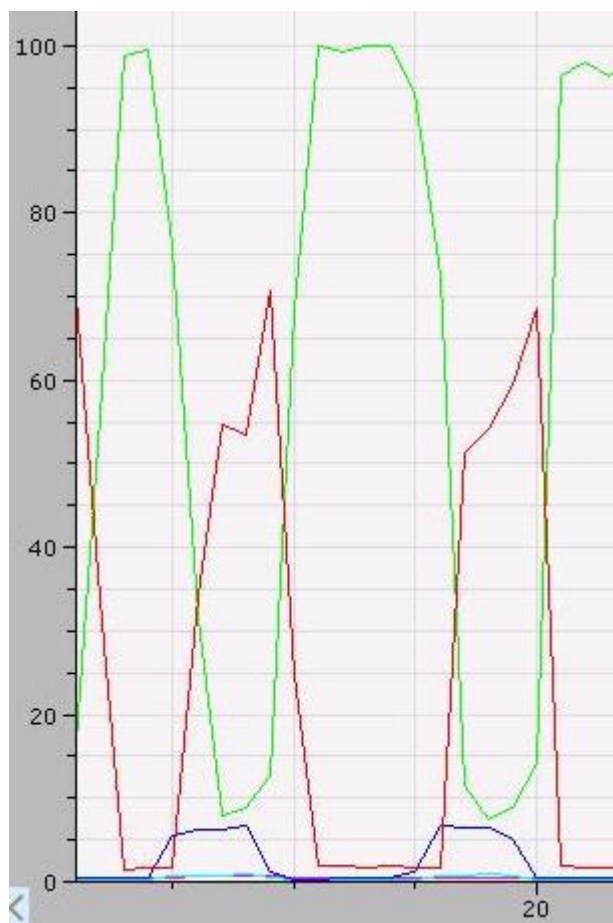
We can put a long measurement time and we can stop it at any time



6.4 – Analyze your measurement



By observing the curves, we can determine which materials are above



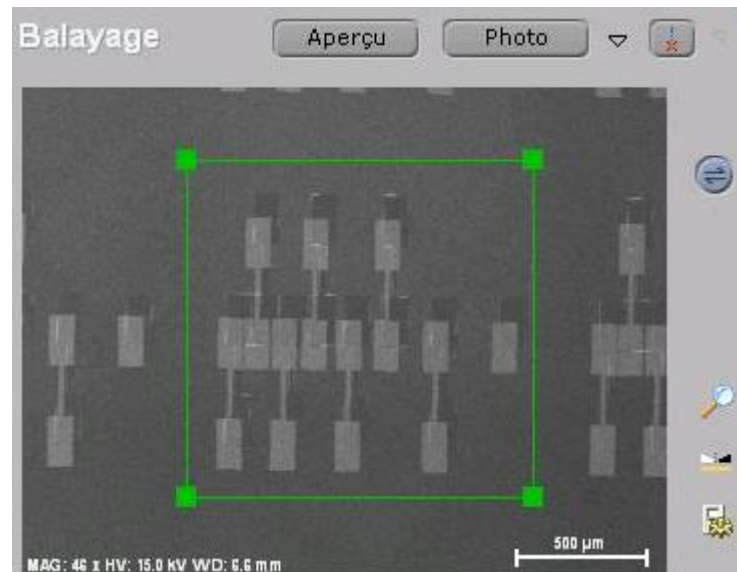
7 – Mesure cartographique

Cartos

7.1 – Make a photo

The yellow arrow determines our measurement

You can move it



7.2 – Determine materials

For a faster analysis check your materials

(avoid doing a spectrum analysis)



7.3 – Start your measurement

Click on  to start the measurement

Click on  to change the measurement parameters

We can put a long measurement time and we can stop it at any time

Temps/point (Qmap)

☒ Temps réel [s] 0.3

☐ Temps corrigé 0.3

Temps minimal recommandé [s] 1.28 s

☐ Coups 1000

Energie min. [keV] 0.25

Energie max. [keV] 20.00

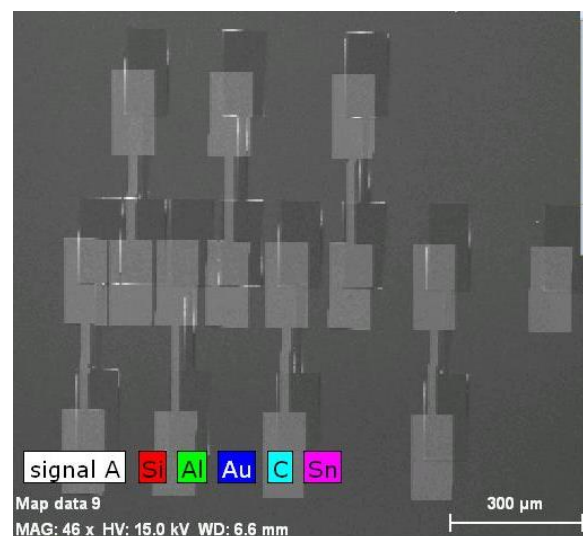
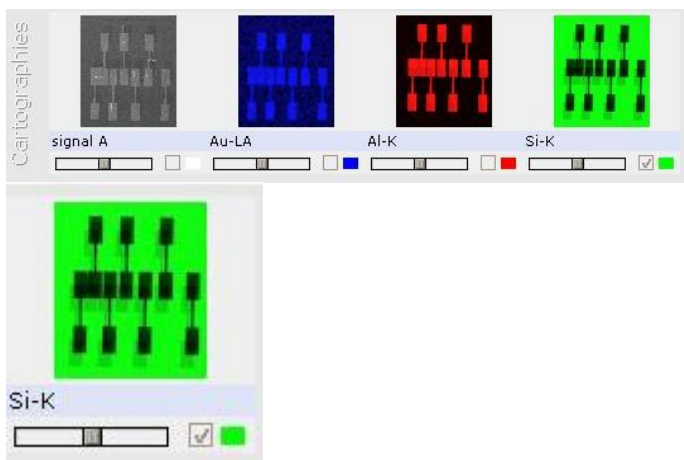
Temps total de mes 15 min

7.3 – Analyze your measurement

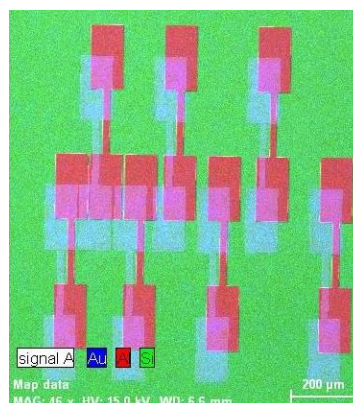


We clic on **CARTOS**

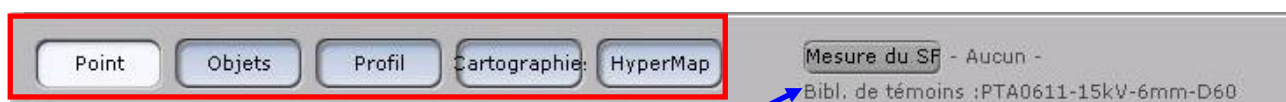
Clic on



We can check several materials

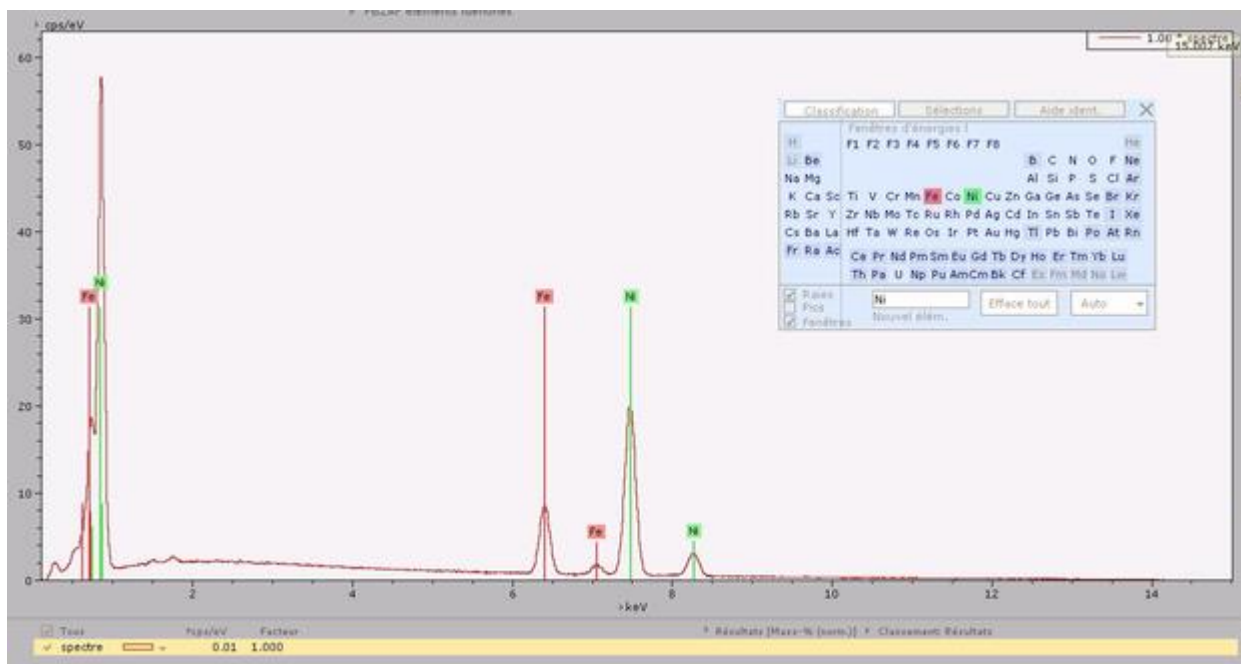


La quantification



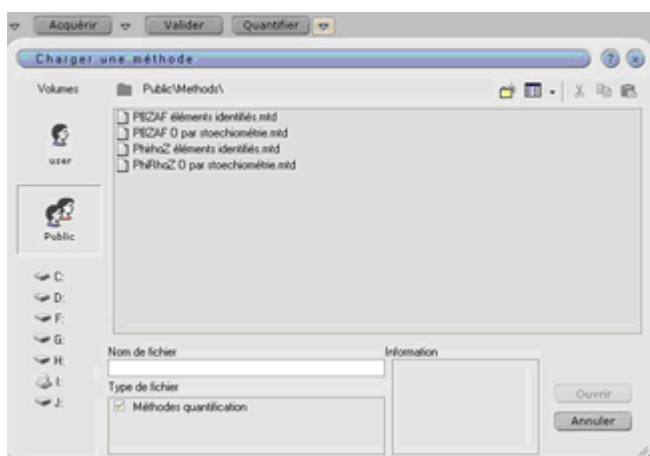
1 – select your measure

Start the measurement on your sample

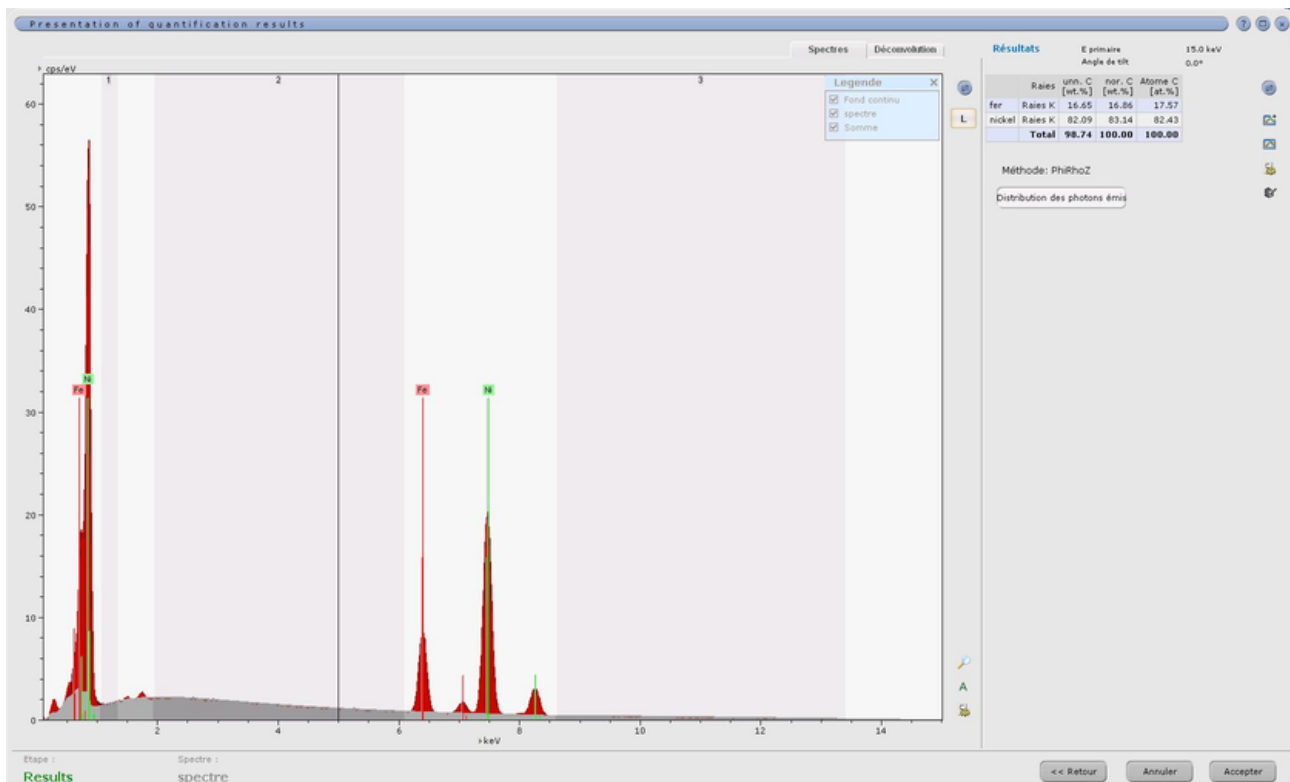


Select your materials

Click on « quantifier »



Choose method « phirhoZ élément identifier »



Cliquer sur « accepter »

Quantification

Travailler a 15kV

Working Distance = 6

Diaphragme = 60

40 Kev 130 kcps