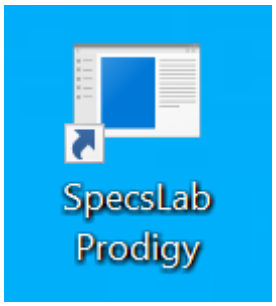
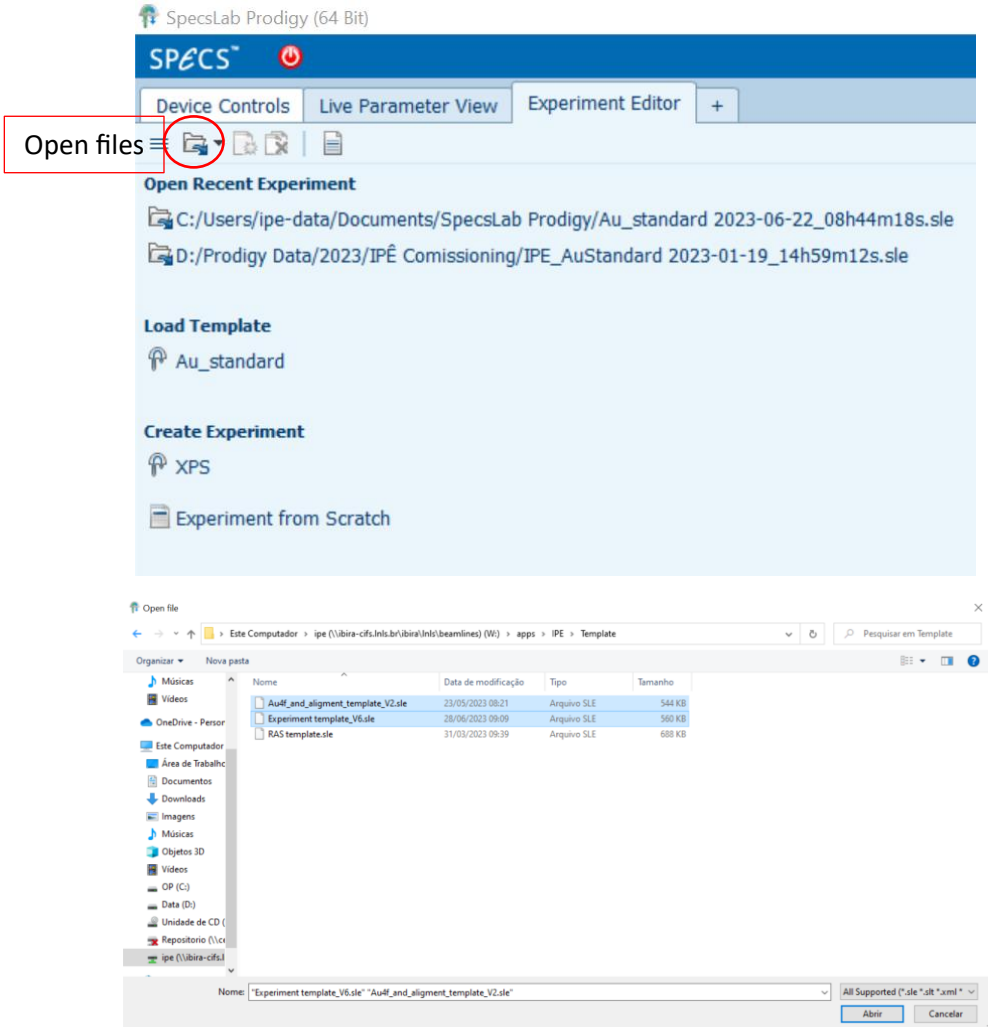
# XPS data visualization and acquisition

v1.0

1 – Opening the software with the templates

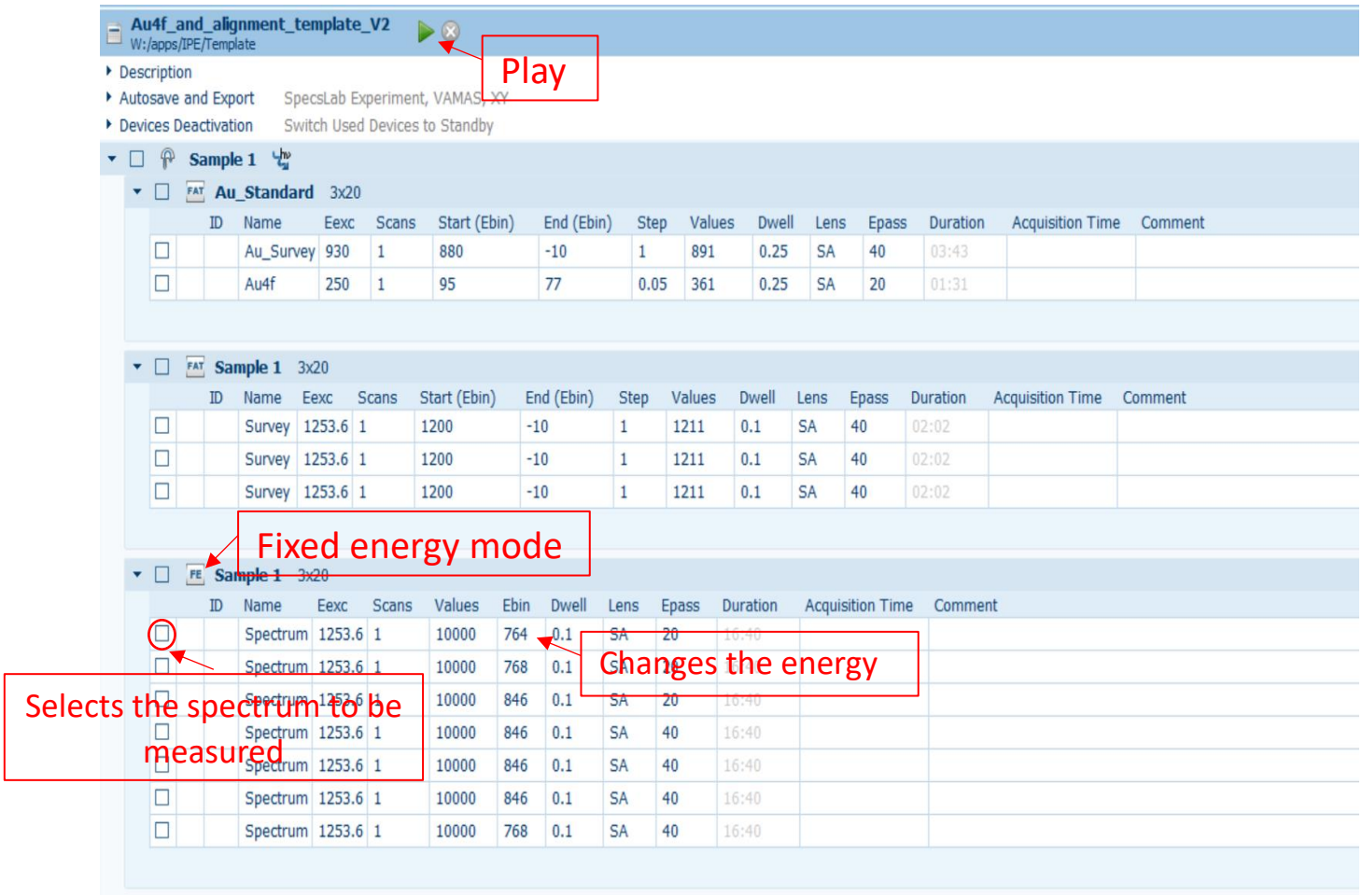
Open the EspecsLab Prodigy. With the software already opened, click in “open file” and select both templates: alignment and experiment (this step should be ready before the user comes in).



2 – Alignment the sample

After opening both templates, the sample should be aligned with the electron analyzer. To align the sample, we use the “Fixed Energy” mode on the alignment template. After choosing the energy (Ebin), select the spectra and press “play” on the top of the file.

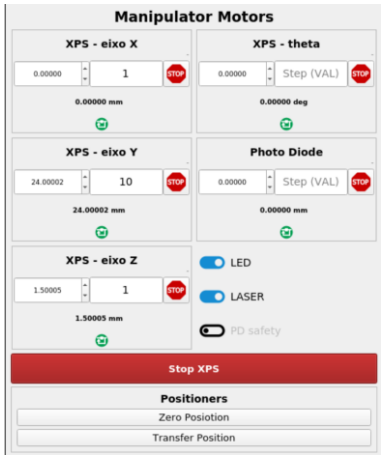


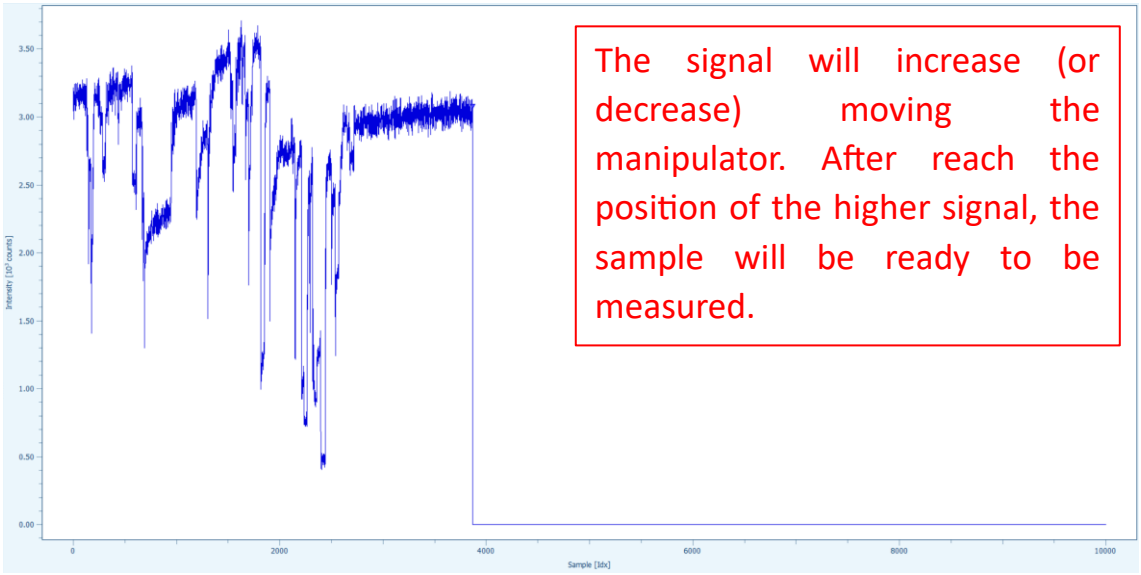

| ID | Name | Eexc | Scans | Start (Ebin) | End (Ebin) | Step | Values | Dwell | Lens | Epass | Duration | Acquisition Time | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Au_Survey | 930 | 1 | 880 | -10 | 1 | 891 | 0.25 | SA | 40 | 03:43 | | |
| | Au4f | 250 | 1 | 95 | 77 | 0.05 | 361 | 0.25 | SA | 20 | 01:31 | | |

| ID | Name | Eexc | Scans | Start (Ebin) | End (Ebin) | Step | Values | Dwell | Lens | Epass | Duration | Acquisition Time | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Survey | 1253.6 | 1 | 1200 | -10 | 1 | 1211 | 0.1 | SA | 40 | 02:02 | | |
| | Survey | 1253.6 | 1 | 1200 | -10 | 1 | 1211 | 0.1 | SA | 40 | 02:02 | | |
| | Survey | 1253.6 | 1 | 1200 | -10 | 1 | 1211 | 0.1 | SA | 40 | 02:02 | | |

| ID | Name | Eexc | Scans | Values | Ebin | Dwell | Lens | Epass | Duration | Acquisition Time | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Spectrum | 1253.6 | 1 | 10000 | 764 | 0.1 | SA | 20 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 768 | 0.1 | SA | 20 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 846 | 0.1 | SA | 20 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 846 | 0.1 | SA | 40 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 846 | 0.1 | SA | 40 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 846 | 0.1 | SA | 40 | 16:40 | | |
| | Spectrum | 1253.6 | 1 | 10000 | 768 | 0.1 | SA | 40 | 16:40 | | |

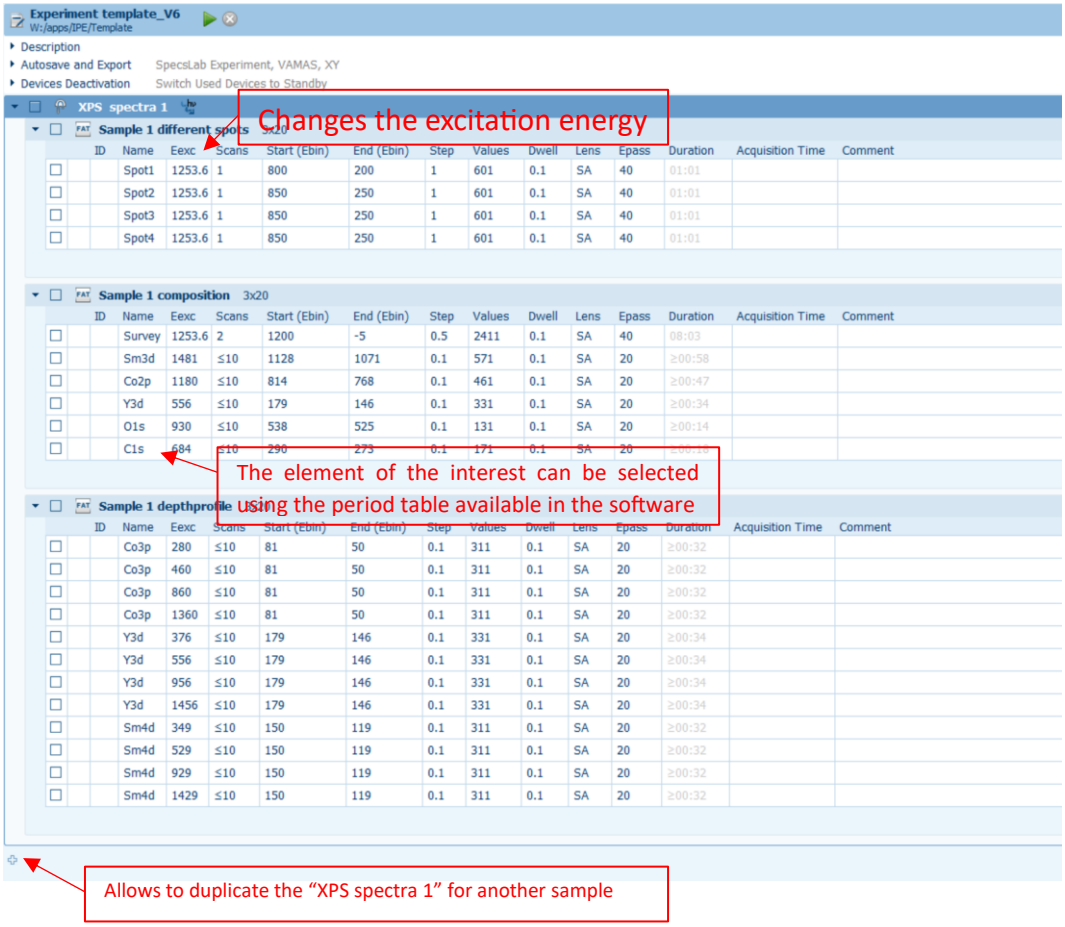
After the electron analyzer starts to count, move the XPS manipulator on “Z” axis until increasing the signal (the alignment procedure will be explained in detail after the user arrives).





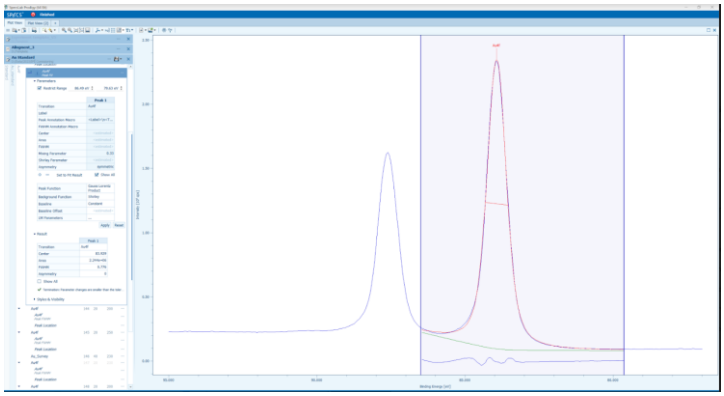

3 – Measuring the XPS spectra

After the alignment step, go to the “Experiment template” and select the spectra that you wish to obtain. In the “XPS spectra 1” is there three spectrum group: **Sample 1 different spots** (in order to check the sample’s homogeneity, a fast scan is acquired in different positions of the sample), **Sample 1 composition** (in this group a complete spectrum survey is made as well the spectra of the element composition in the sample) and **Sample 1 depthprofile** (in order to investigate the composition in different depths is possible to chance the excitation energy).



4 – Visualizing the data

In the “plot view”, doble click in the spectra of interest. The spectra must appear during the measuring.



5 – Exporting the data

The data is automatically exported into two forms “x, y” (Binding energy x cps) or “.VMS” (format used in the “CasaXPS” software) and different files for each group. The experiment can be exported in a single file as well. Click in “Export” and select the format.

## Opening .VMS files

The export data is in .VMS format can be opened and treated using the following software:

CasaXPS: available in http://www.casaxps.com/ (Free version)

**Useful guides for CasaXPS:**

- Systematic and collaborative approach to problem solving using X-ray photoelectron spectroscopy - https://doi.org/10.1016/j.apsadv.2021.100112
- http://www.casaxps.com/casaxps-training/training-events.htm

- http://www.casaxps.com/help_manual/

## *CasaXPS Demo version doesn’t allow to save treated data!!

## Opening .SLE files

.SLE files can be opened using the same software used for data acquisition (Specs Lab Prodidy).

The specs Lab prodigy allows to visualize, treat data and export the data in different formats.

All the features are available in free version such as: peak finding, peak fitting, different types of line shapes, among others. The example of a quick fitting is shown on the next figure:

Prodigy: available in https://www.specs-group.com/nc/specs/products/detail/prodigy/ (Free version)