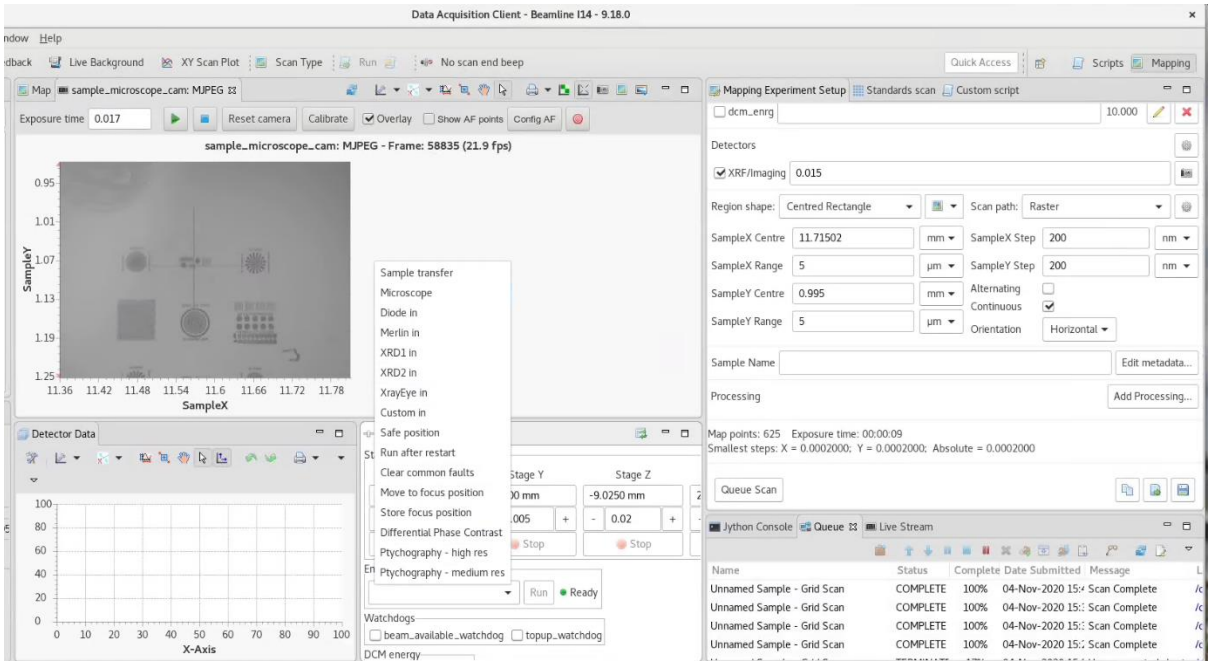
Remote connexion to Diamond's workstations & Troubleshooting

Starting and setting up the GDA software

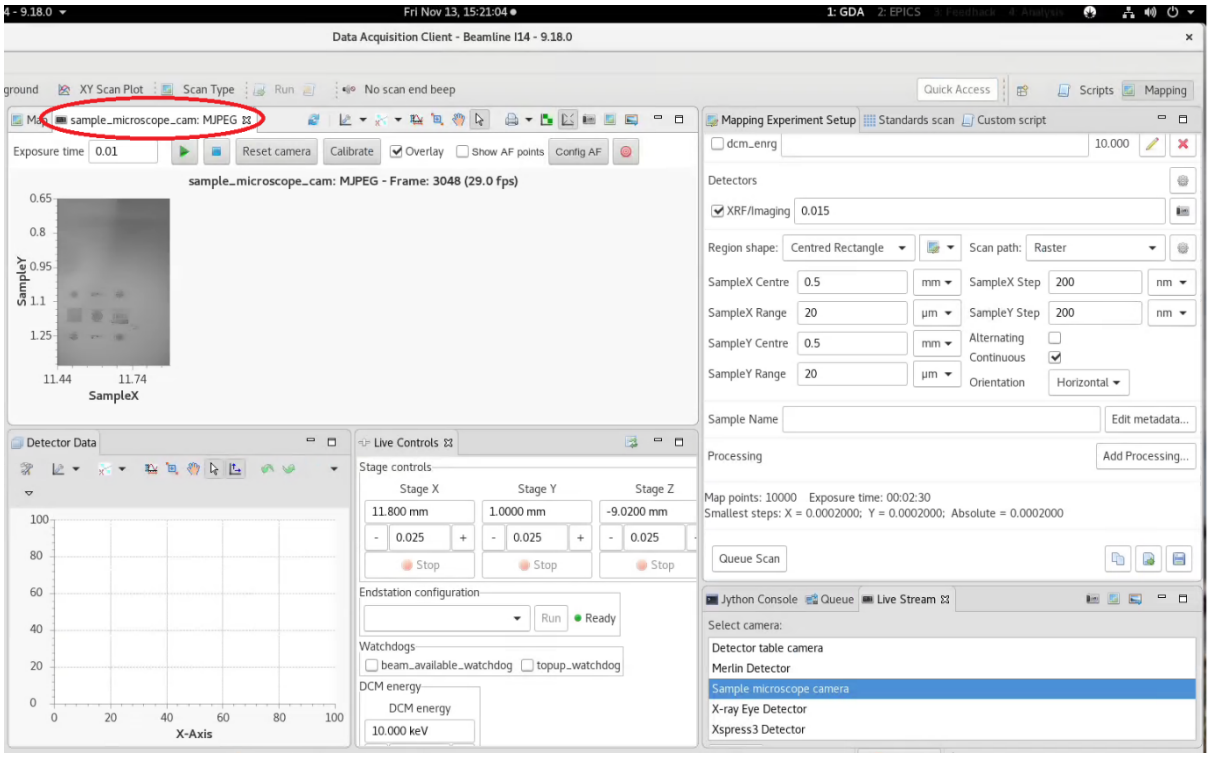
GDA is continuously evolving, so in order to get the latest release & updates, type: 'gdaclient --reset' in a terminal at the beginning of your experiment (as shown below), which will automatically launch the updated software interface and the Log Panel. If the GDA freezes during the beamtime, you can close it (and the Log Panel), and just type: 'gdaclient' for re-launching it.

There are several sub-sections in the GDA screen. One of the main features is the scroll-down menu that appears at the 'Endstation Configuration' at the centre-down of the screen (see below), where the I14 detectors are selected.

At the beginning of each experiment, after loading the sample in the experimental hutch (EH2), the "Microscope" of this scroll-down menu is selected in order to inspect the sample using the Andor camera.

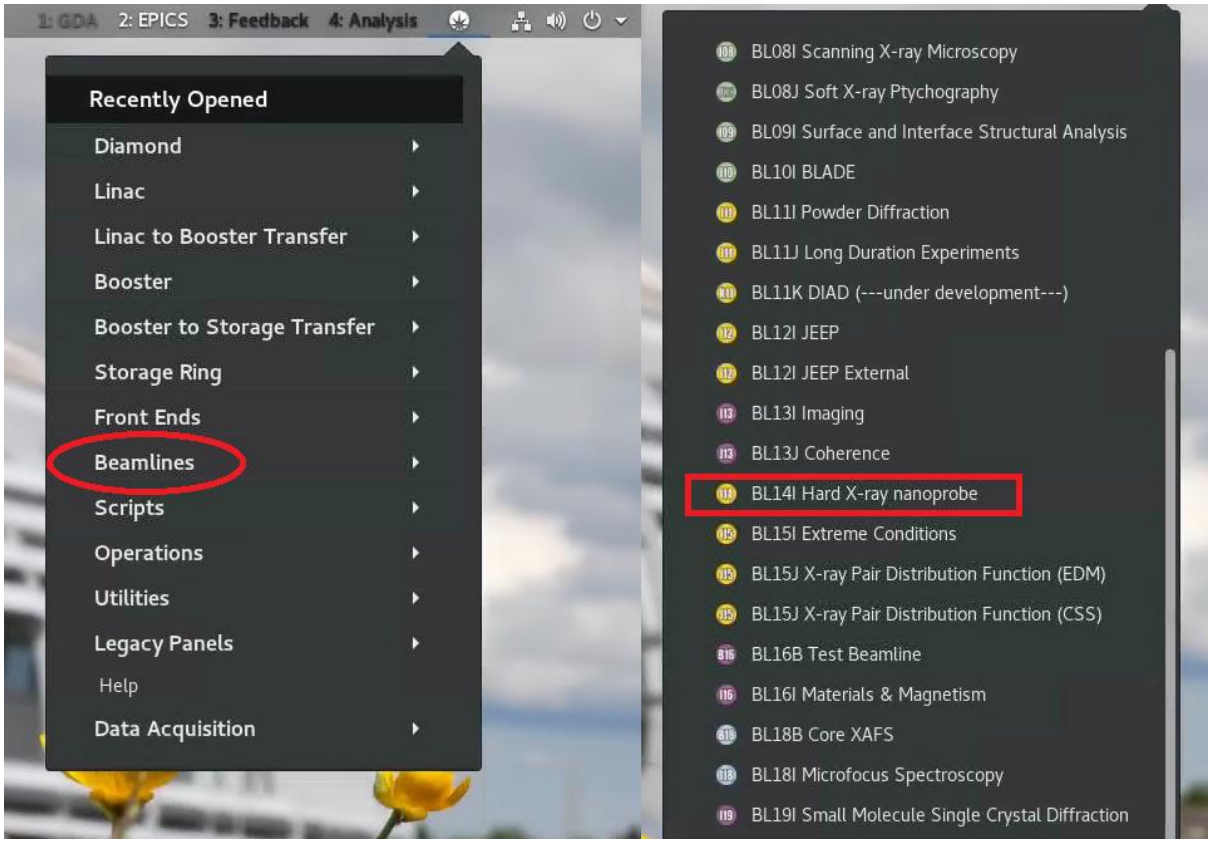


In the “Quick Access” tab, type and select ‘Live Stream’. A new tab will appear at the bottom-right, where the Sample microscope camera can be selected. Double-clicking that, a new tab called ‘sample_microscope_cam MJPEG’ will appear, which can me moved to the bigger mapping section by dragging the tab (red ellipse below for the final view). For initiating the camera view, click the start button and ensure that the “Exposure time” is adjusted to a reasonable number (~0.013 in the W calibration chart, which may vary depending the nature of the experimental samples).

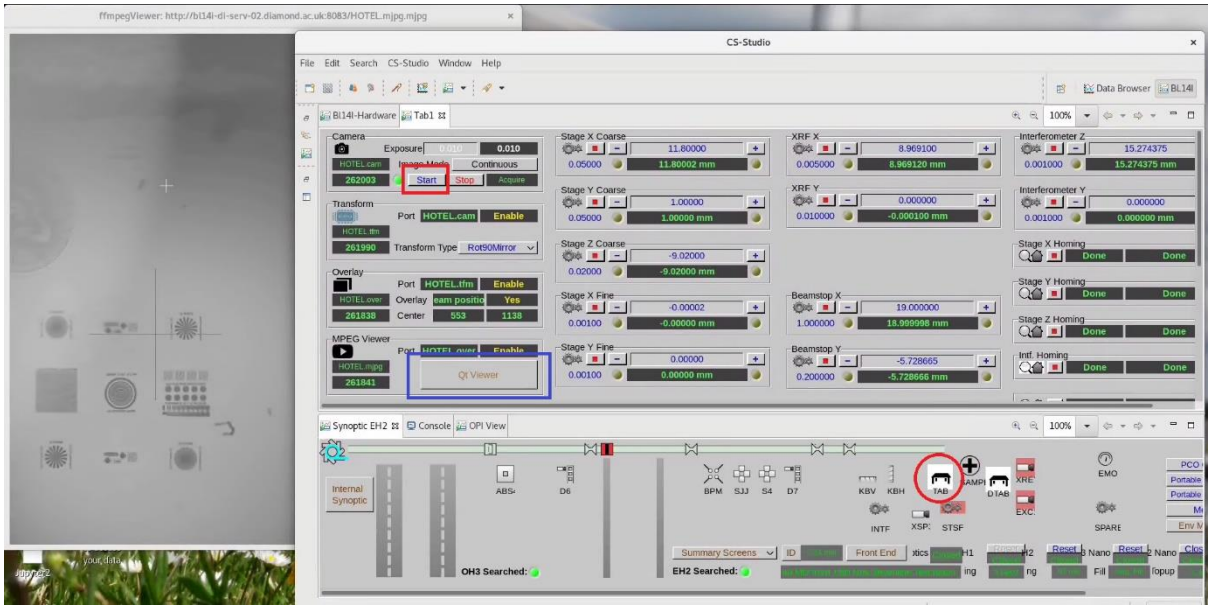


Troubleshooting: if you have problems seeing something on the camera, one tip is to switch off the lights inside the EH2 (which you would need to do manually at the right-hand side of the control panel where you swipe your badge for initiating the experimental hutch search).

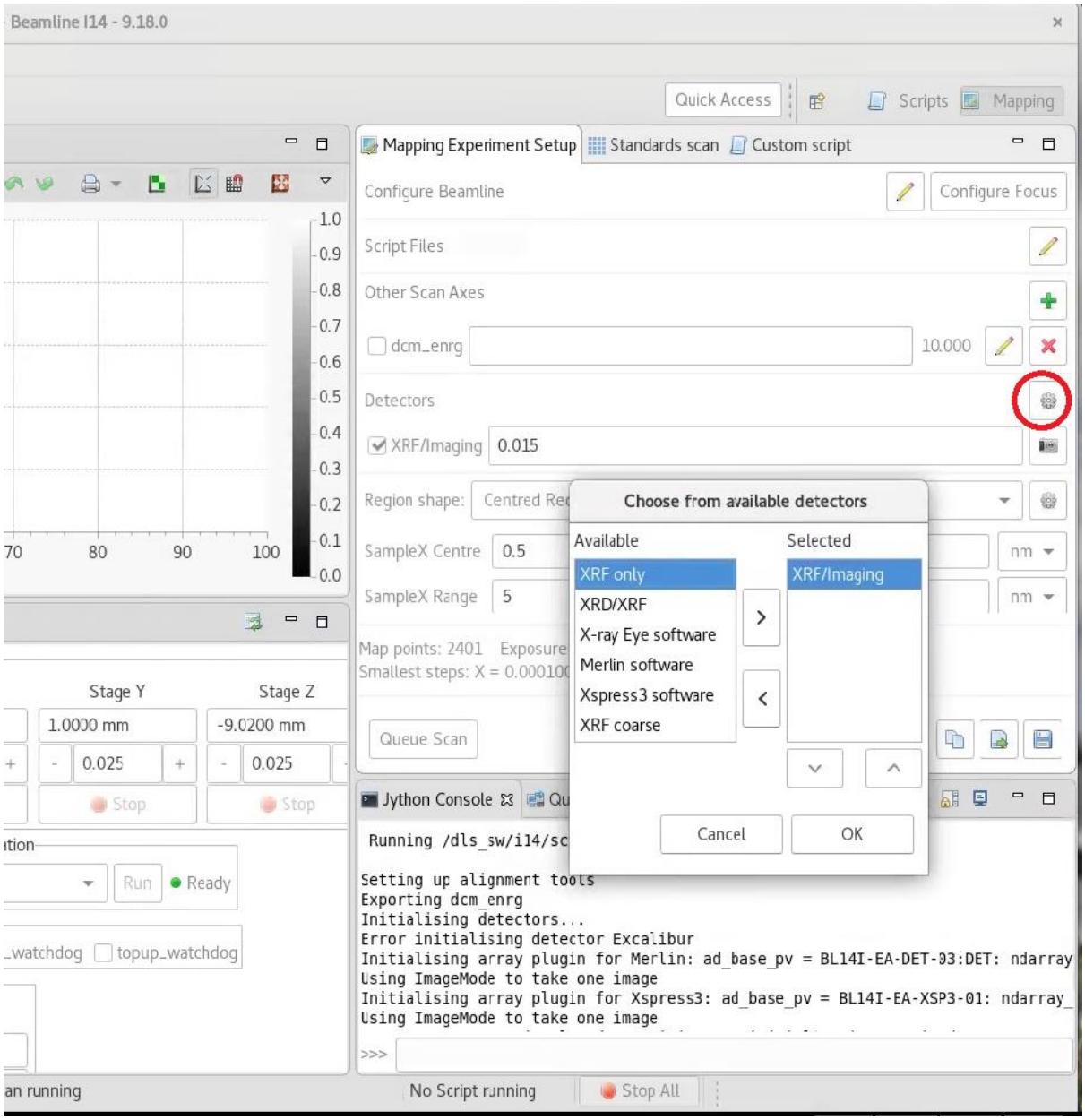
Nonetheless, if you don't see anything on the sample microscope, you can open the EPICS controller software, by selecting the white Diamond Light Source logo in the EPICS tab of your Linux session (see below), for subsequently clicking in 'Beamlines → BL14I Hard X-ray nanoprobe'.



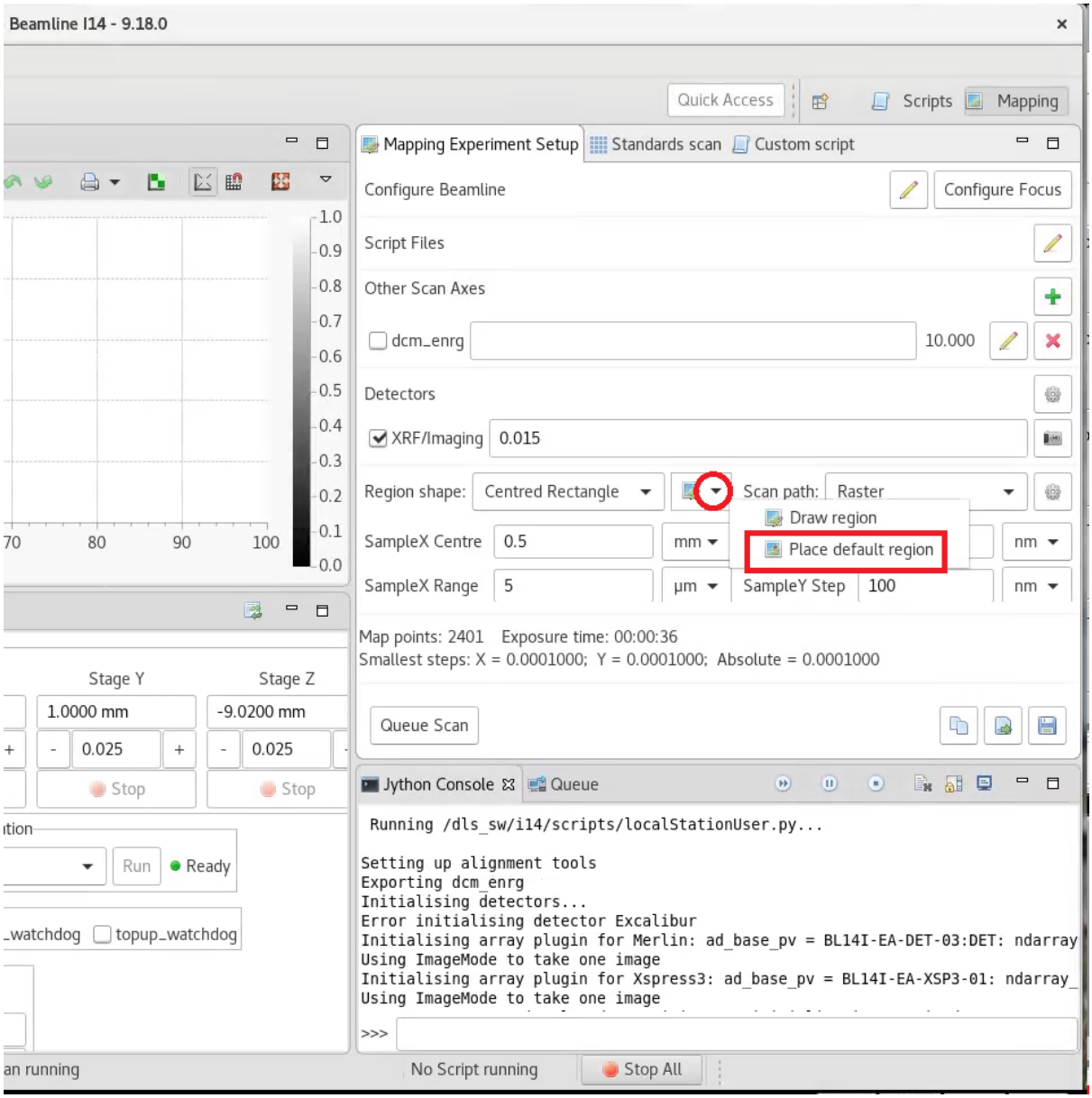
In the Synoptic EH2 tab (bottom), select the icon "TAB" (red circle below) which will open a large controller interface, where the 'Camera' cab be started again (red rectangle). The 'QT Viewer' button (blue rectangle) will open a viewing window to operate the camera. Once the camera is active, the sample must be placed in focus by adjusting up/down the "Stage Z course", either in the EPICS or in the GDA interface (called just "Stage Z").



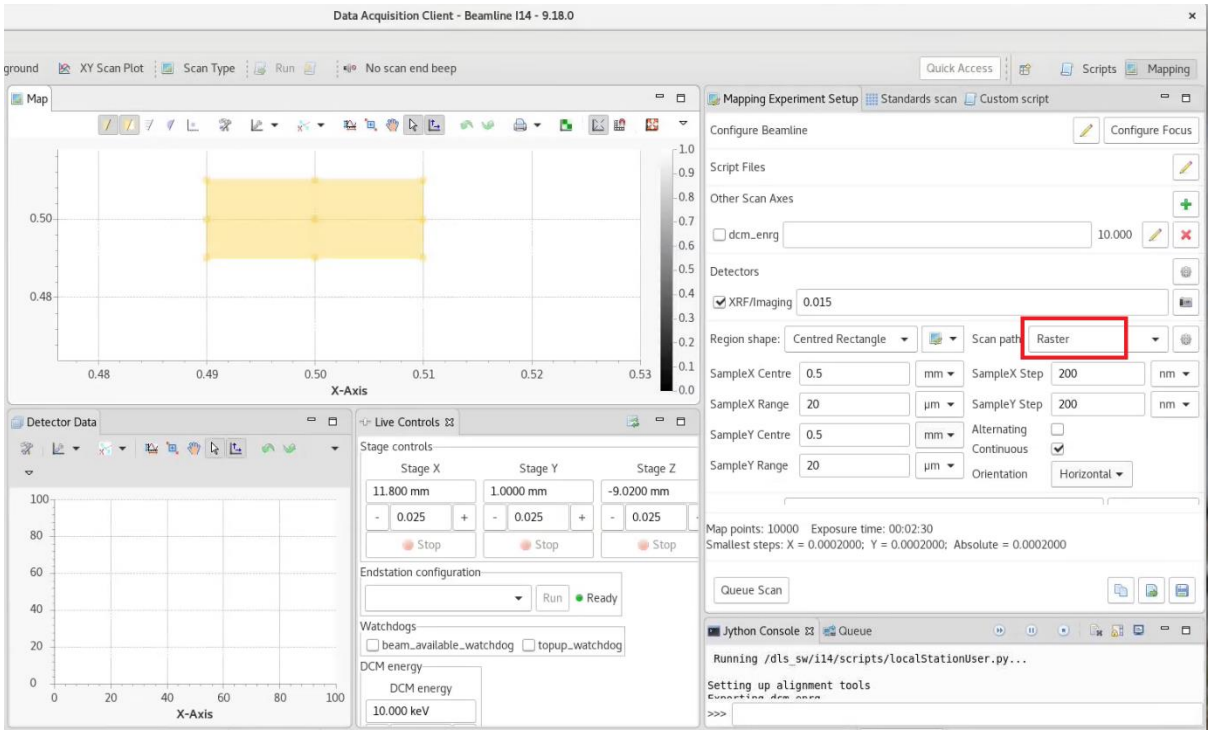
Back to GDA, there are a few things that need to be set every time the software is reset. First, in the ‘Mapping Experiment Setup’ tab, select the gear icon at the Detectors area (red circle below). Depending on the analysis to be performed at I14, there need to be more detectors in the “Selected” region (right-side). For example, for acquiring X-ray fluorescence microscopy (XRF) and differential phase contrast (DPC) with the Merlin detector, keep the ‘XRF/Imaging’ option selected, as shown below. If you are about to do XRD, also pass the option ‘XRD/XRF’ to the right. Then, ensure that the desired detector is clicked so you can change the acquisition time - 0.015 s below (= ~66.6 Hz):



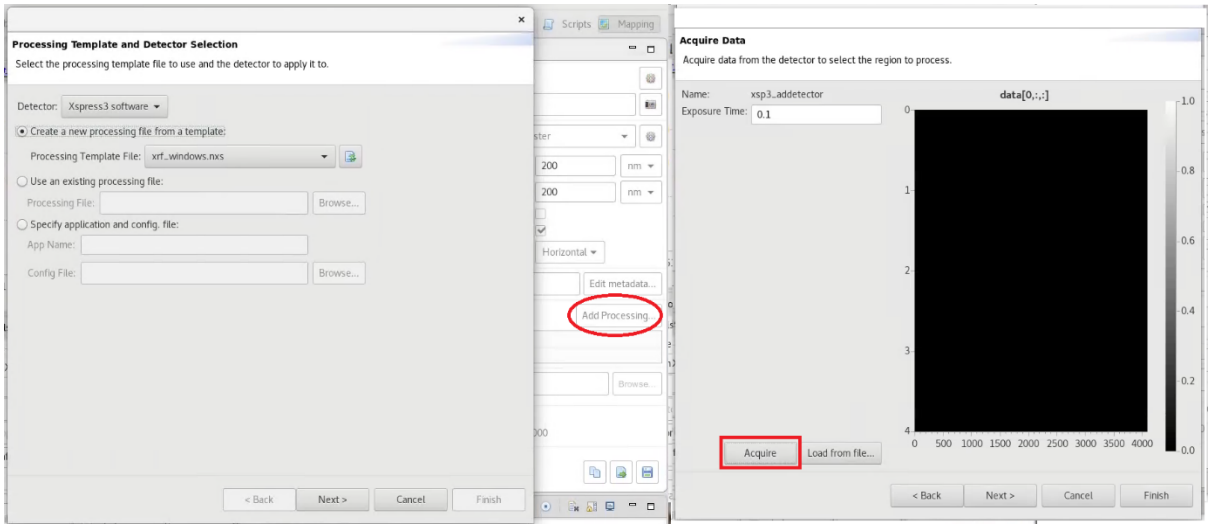
After zooming in the sample in the ‘sample_microscope_cam’ perspective, localise the region of interest and place the large cross on top of that (scroll in/out with the mouse wheel to see the cross better). Subsequently, this location should be transferred to the “Mapping” tab, by clicking in the small arrow at the right of ‘Region Shape’ (red circle), selecting later ‘Place default region’ (red rectangle).



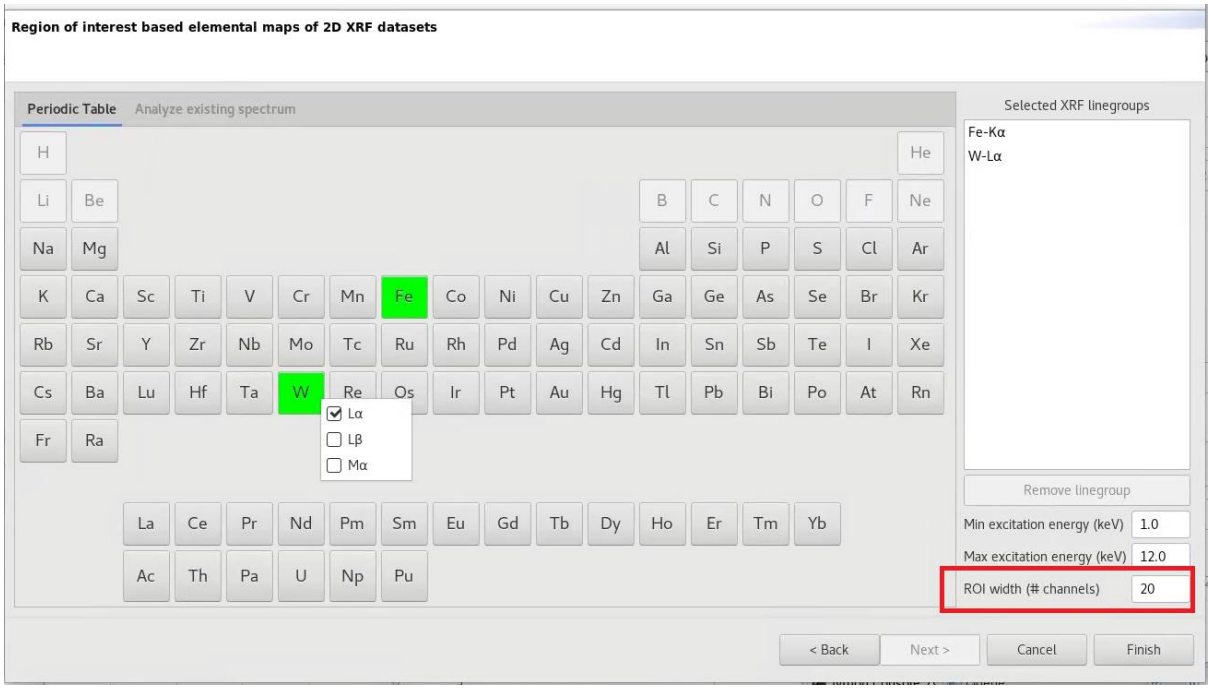
Then select the ‘Raster’ option in the “Scan path” (red rectangle below). This will allow you increase the ‘SampleX Range’ and the ‘SampleY Range’, either by typing the numbers (adjusting the scale into µm) or manually increasing the yellow mapping area in the “Map” perspective at the centre-top of the screen (you may need to scroll out/in with the mouse wheel to find this yellow rectangle). In addition, the pixel size of the XRF map can be modified adjusting the ‘SampleX Step’ and the ‘SampleY Step’ at the right (selecting nm as scale).



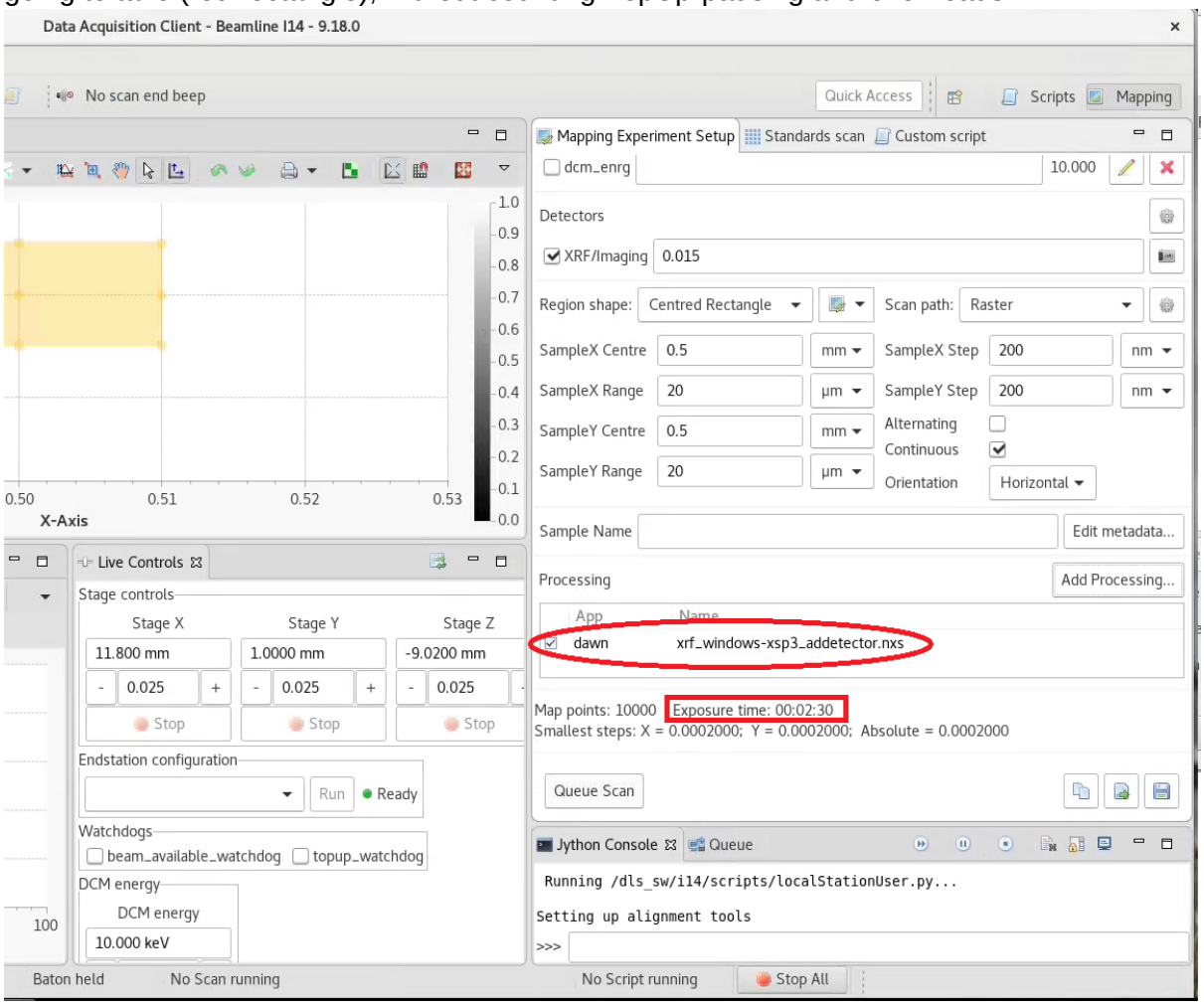
Below the Region shape selection, if you move dawn in the right-hand side bar (please, avoid scrolling down with the mouse wheel at this point, since that can alter the scan path and the sample Range selections), a processing chain can be selected using the ‘Add Processing’ button. For the XRF processing chain, select the ‘Xspress3 software’, then click Next, and click ‘Acquire’ in the following window until you can select Next again.



In the following window, select the elements to include (either their Kα or their Lα emission lines, according to the selected energy to be used) until they appear in green. Also, type 20 as ‘ROI width (number of channels)’ as shown by a red rectangle below:



Finally, ensure that the generated processing chain is selected (red ellipse). Once the mapping area, the step/pixel size and the acquisition time (0.015 s below) are selected, the expected “Exposure time” will be updated to provide you an estimation of the time the XRF is going to take (red rectangle), without counting TopUp-pausing and overheads.



The last step will be providing a ‘Sample Name’ to the scan (just for identification in the GDA queue, all scans will be saved by number in the scan/processed directories, eg. i14-102456.nxs) and clicking the “Queue Scan” button. Switch to the ‘Queue’ tab at this point to ensure that the scan is running, waiting for the scan number + selected processed scan to appear at the left-hand side of the GDA interface.