

X3B OPERATING INSTRUCTIONS FOR EXAFS

Summary

1. X3B beamline has Si(111) crystal with an option to change different energy range and resolution. When working with (111) crystal, it is important to cut off second harmonic by a proper mirror angle. Ni mirror is used for vertical focusing and second order harmonic rejection. If the previous users used different crystal, reposition the sample box and complete steps 2 to 4. Otherwise, proceed to step 7.
2. Get into SETUP in the computer program. Set the crystal to be used, save and exit.
3. Move the mirror out of the beam. Move the beam to pass through the chosen Si crystal by setting the primary aperture (PA) positions. To do this, get into Optic Control setup and adjust PA Top, Bottom, Left, Right and Vertical Position. Adjust Io. Open completely PAs and slowly move them until you see that they start clipping the beam.
4. Adjust Hutch Apertures (HA) vertical size and position.
5. Adjust mirror angle to 0 and move mirror into the beam until it cuts the beam in half.
6. Adjust mirror angle for the energy to be used. See whether you can locate the beam using the meters. Place a piece of x-ray sensitive film in front of the sample box and turn the beam on for a minute. Expose the rest of the film using a flashlight. Locate the beam center and move the beam accordingly. Place a 2-mm wide slit into the sample holder and put a piece of the film on top of it. Locate the beam using the same procedure described above and move the beam if necessary.
7. Find out which element the users want to run. Locate its E_0 and check the mirror reflectivity and the optimum mirror angle (in mrad) for the energy range around E_0 .
8. Turn beam off. Measure offsets. Turn beam on and run a mid-range scan (50 eV around E_0 , in steps of 1 eV) of the element (metal foil). Take derivative between I1 and I2. Find the energy of the first maximum (E_0) and compare with the tabulated value. Subtract their difference from the energy of the last point to calibrate E_0 .
9. Go 200 eV below the edge, Go to setup, turn off focus (radio button), adjust the beam size, set PA and HA, cut the beam to around 40% by HA.
9. Run a near-edge scan (20 eV around E_0 in 0.5 eV intervals).
10. Run the procedure explained in the 13-Element Germanium Detector Setup List.
11. Print all motor positions and save them for further reference (Click on Move Motors under Actions menu, then click on Print Motor Positions).