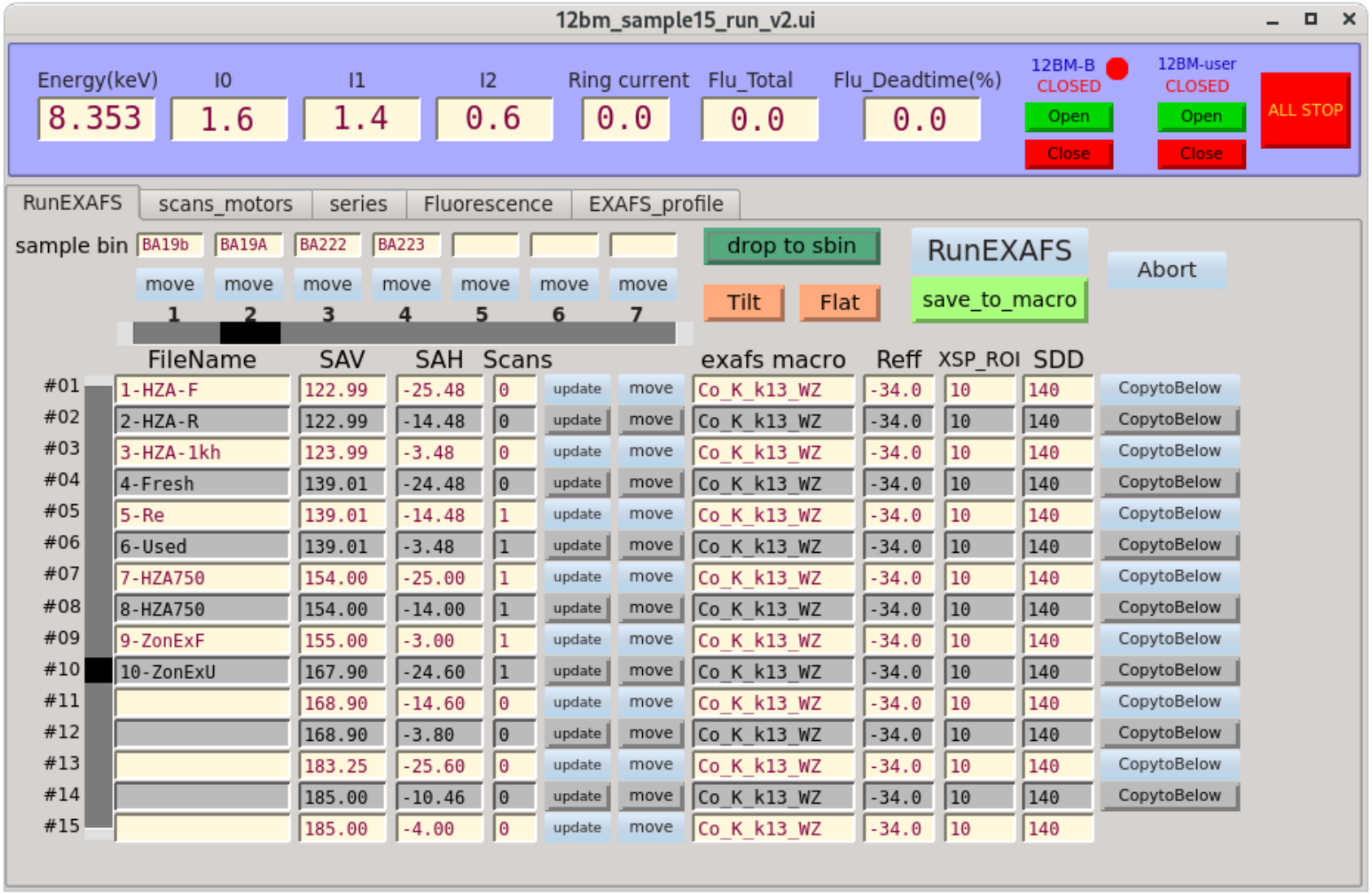
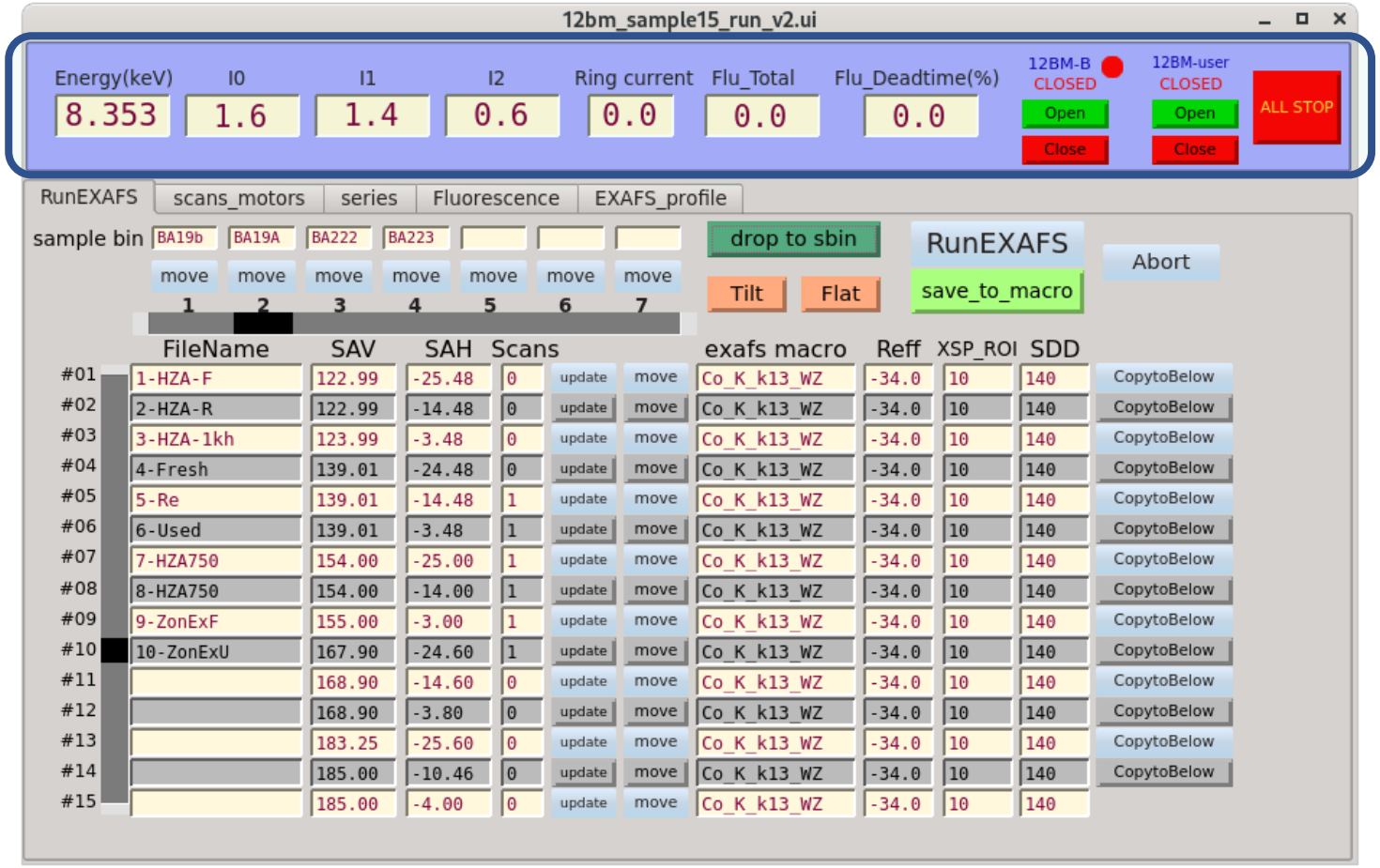
12bm_sample15_run Walk Thru



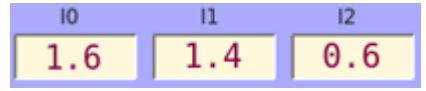
12bm_sample15_run Walk Thru

Tab 1 (RunEXAFS)

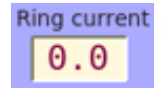


- Current Energy of Monochromator

- Ion Chamber Values

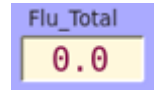


- Ring Current of Synchrotron

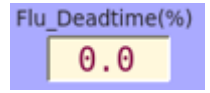


Usually 135mA – 200mA

- Fluorescence Total



- Fluorescence detector deadtime
  - Do not exceed 2.5%

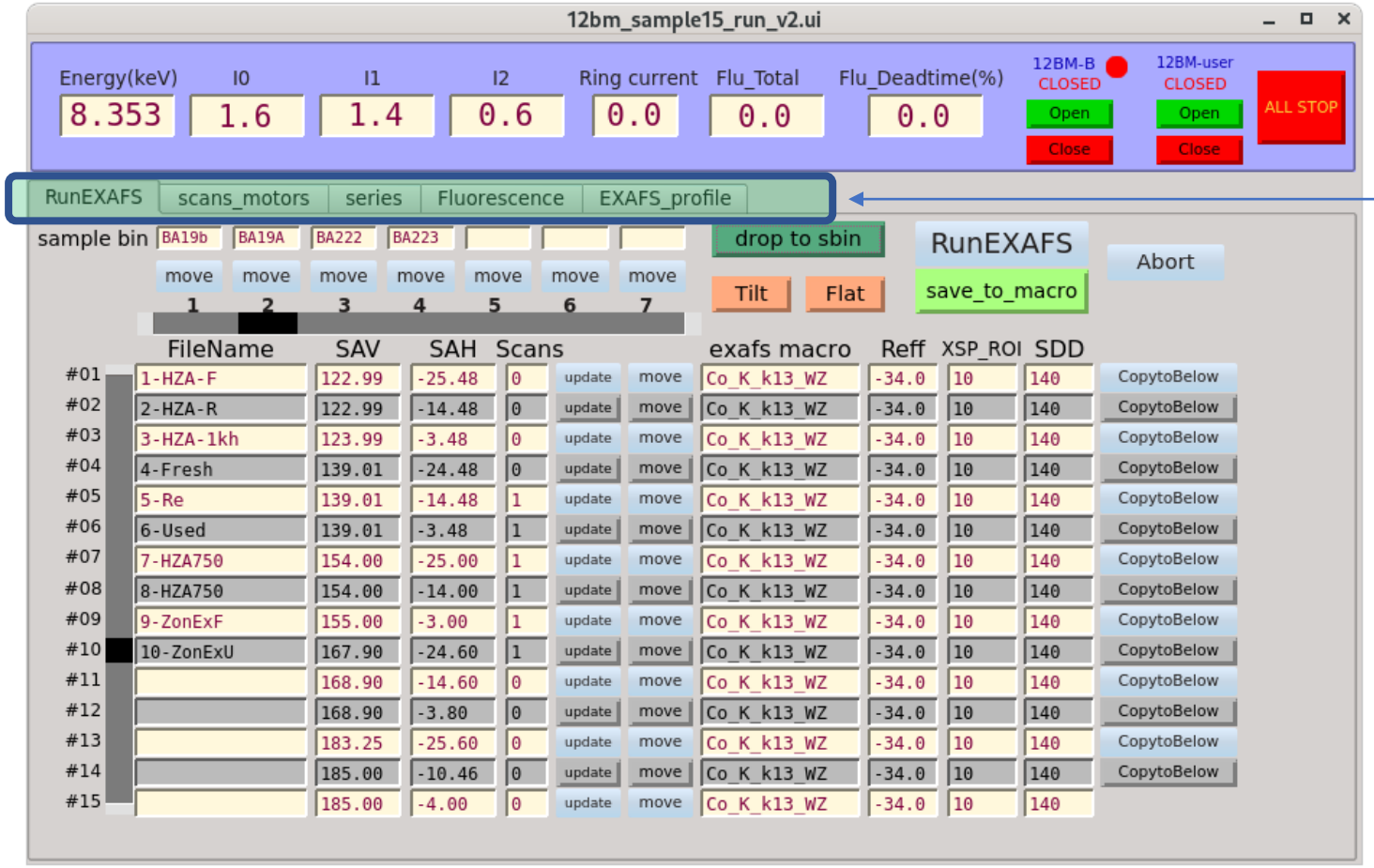


- 12BM-B shutter open/close
- 12BM-user shutter open/close

- All Motor Stop Button

12bm_sample15_run Walk Thru

Tab 1 (RunEXAFS)



- **5 Selection Tabs**
  - RunEXAFS (Tab 1)
    - Main Window to run frames
  - Scan_motors (Tab 2)
    - Move Sample motors
    - Detector
    - Reference Foils
    - Run Simple Scans
  - Series (Tab 3)
    - Run Multiple Elements/frame
  - Fluorescence (Tab 4)
    - XSP_ROI = #
  - EXAFS_profile (Tab 5)
    - Pre-edge, edge, post-edge profile

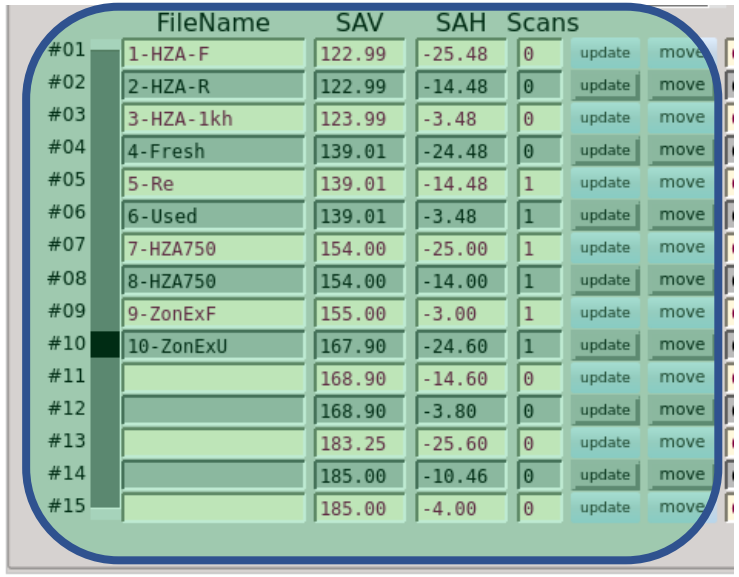
12bm_sample15_run Walk Thru

Tab 1 (RunEXAFS)

- Sample Bin
  - Enter in Frame Number
  - Click move to pick up frame
  - drop to sbin to lower frame into sbin
  - Tilt for fluorescence mode
  - Flat for transmission mode
  - RunEXAFS to begin frame scan
  - save_to_macro for series Tab 3
  - Abort to exit scan

12bm_sample15_run Walk Thru

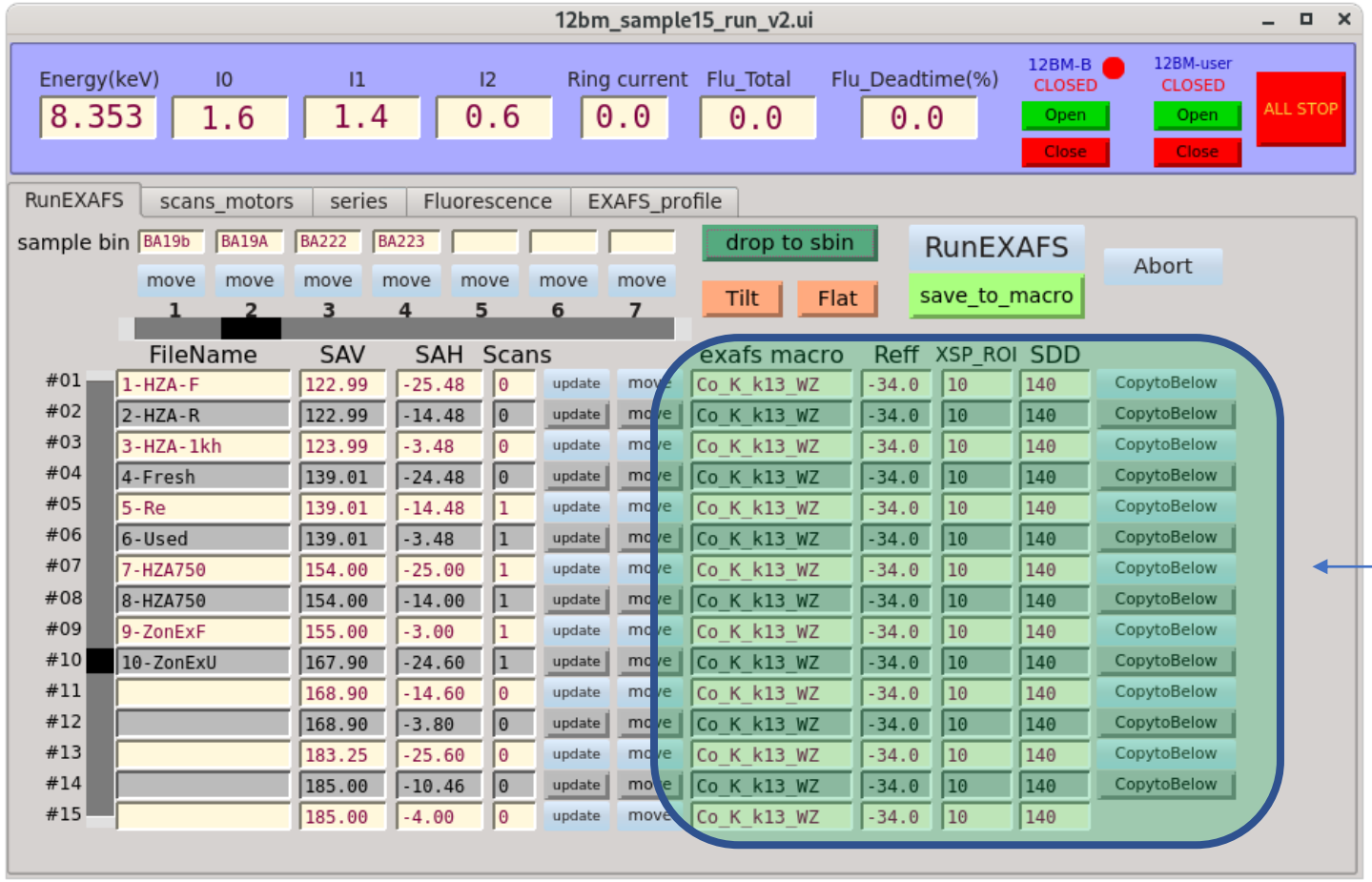
Tab 1 (RunEXAFS)



- Filename – SAV – SAH – Scans
  - The weblink/QR code sent will fill-in the Filename/Scans data
  - For manual entry enter a filename with no spaces or special characters only use dashes or underscores. Also enter the number of scans needed for each sample
  - SAV/SAH are set near the previous users samples so check these
  - The update will update the current values of SAV/SAH to the current motor positions
  - The move will move the Sample Frame to that position

12bm_sample15_run Walk Thru

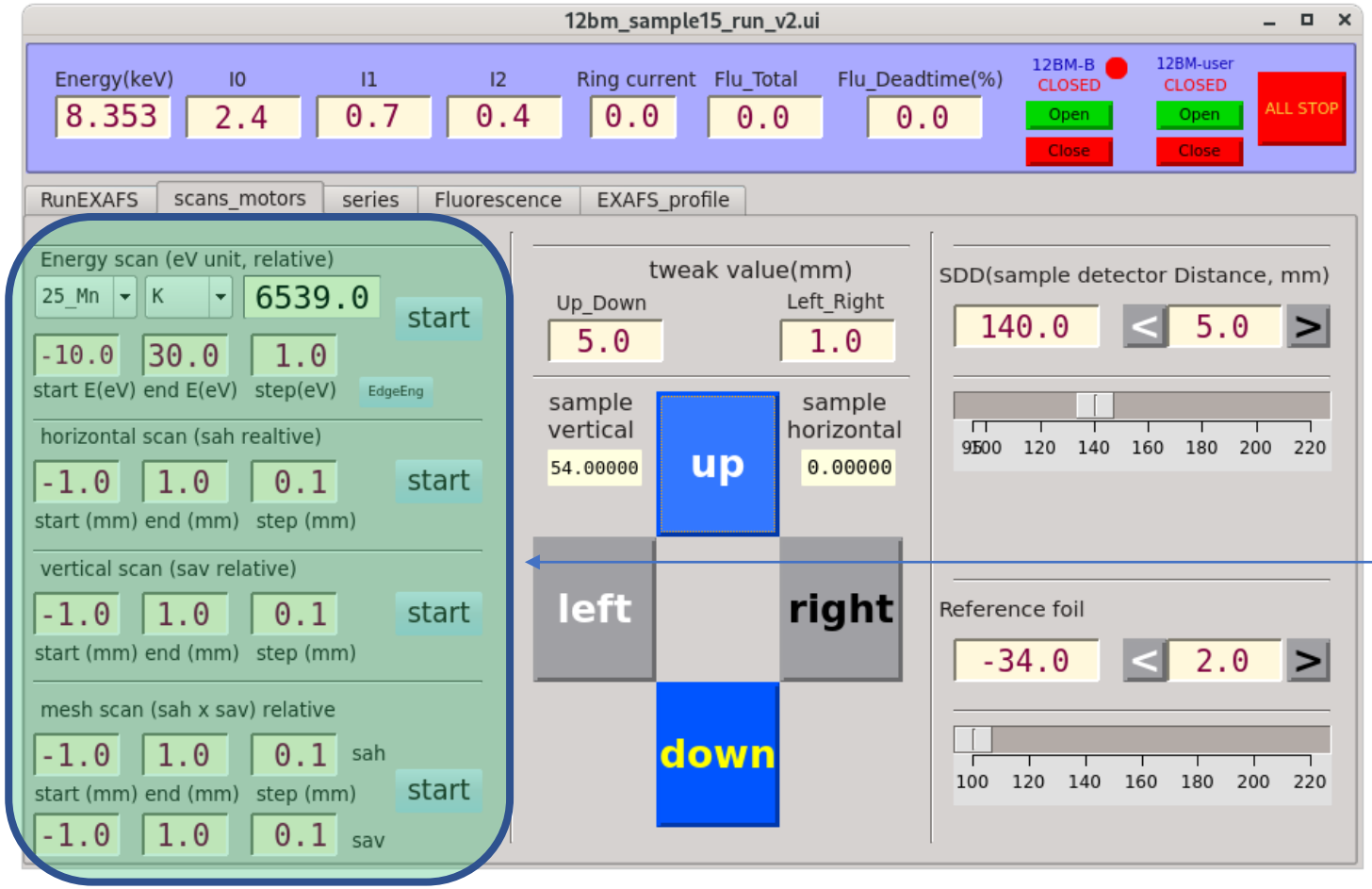
Tab 1 (RunEXAFS)



- exafs_macro see (Tab 5)
- Reff is the reference foil position (Tab 2)
- XSP_ROI is from (Tab 4)
- SDD is the Sample to Detector Distance
  - Range is 50mm to 140mm from the from the sample (Tab 2)
- Click CopytoBelow to copy parameters to all the cells below

12bm_sample15_run Walk Thru

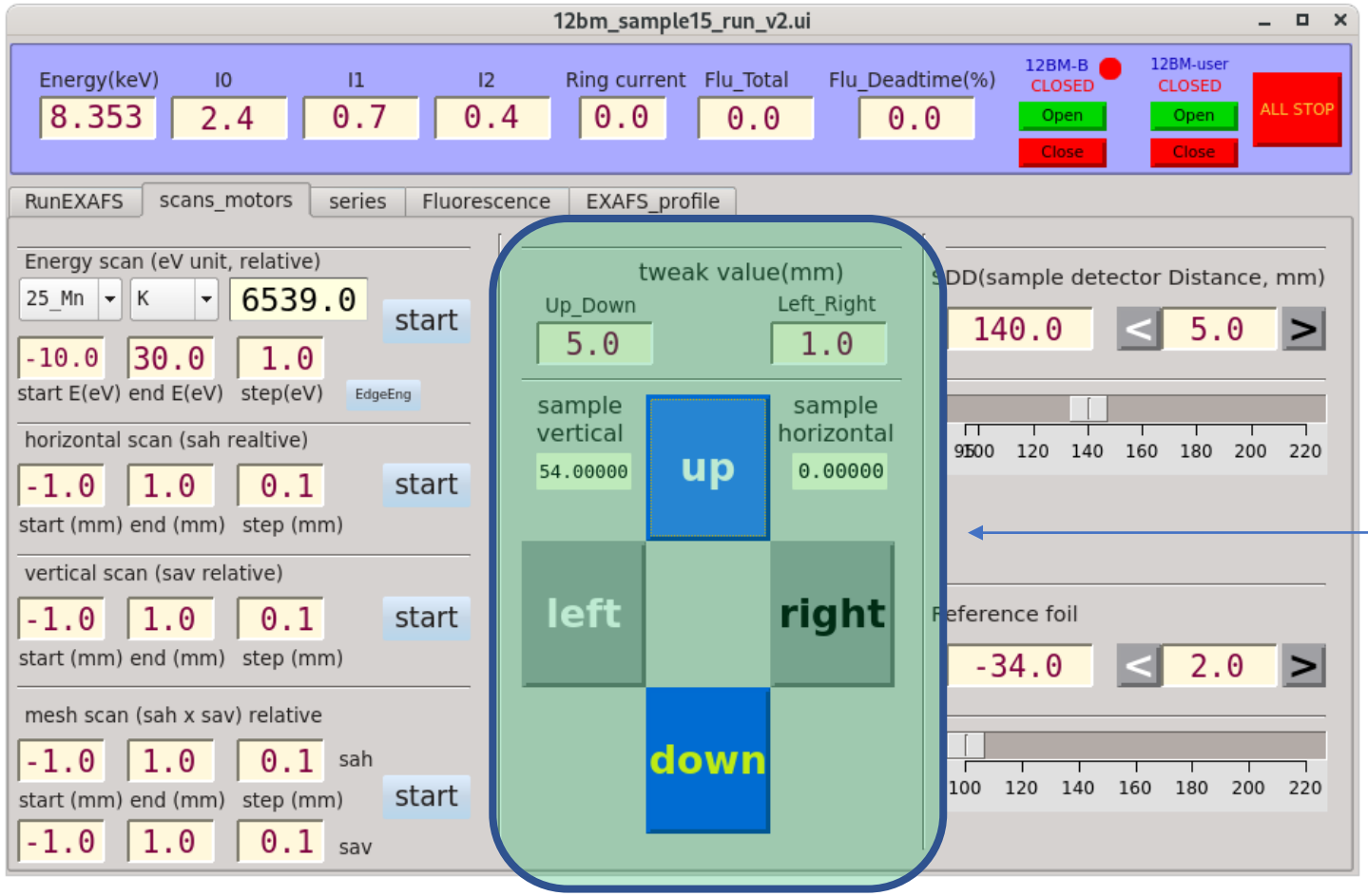
Tab 2 (scans_motors)



- Set Simple Scans
  - Set Element and Edge (K, L3, etc)
  - Horizontal Sample scan of SAH (Sample Horizontal)
  - Vertical Sample Scan of SAV (Sample Vertical)
  - Mesh Scan for SAH and SAV
- These scans are all relative scans in mm

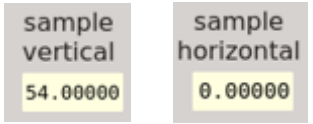
12bm_sample15_run Walk Thru

Tab 2 (scans_motors)

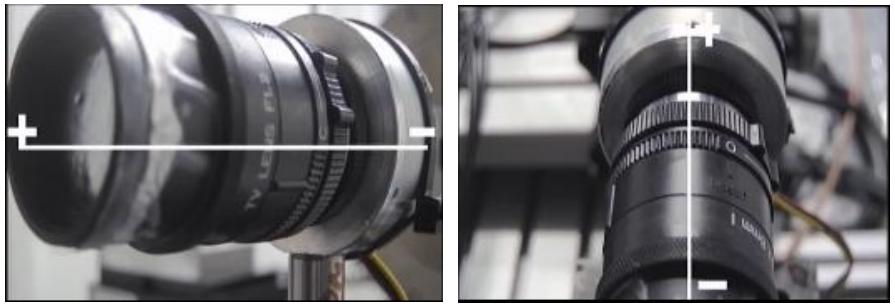


- Tweak the Sample Stages SAV and SAH
  - You can set the relative step value Up_Down and Left_Right in mm

  - Shows the Actual positions of each

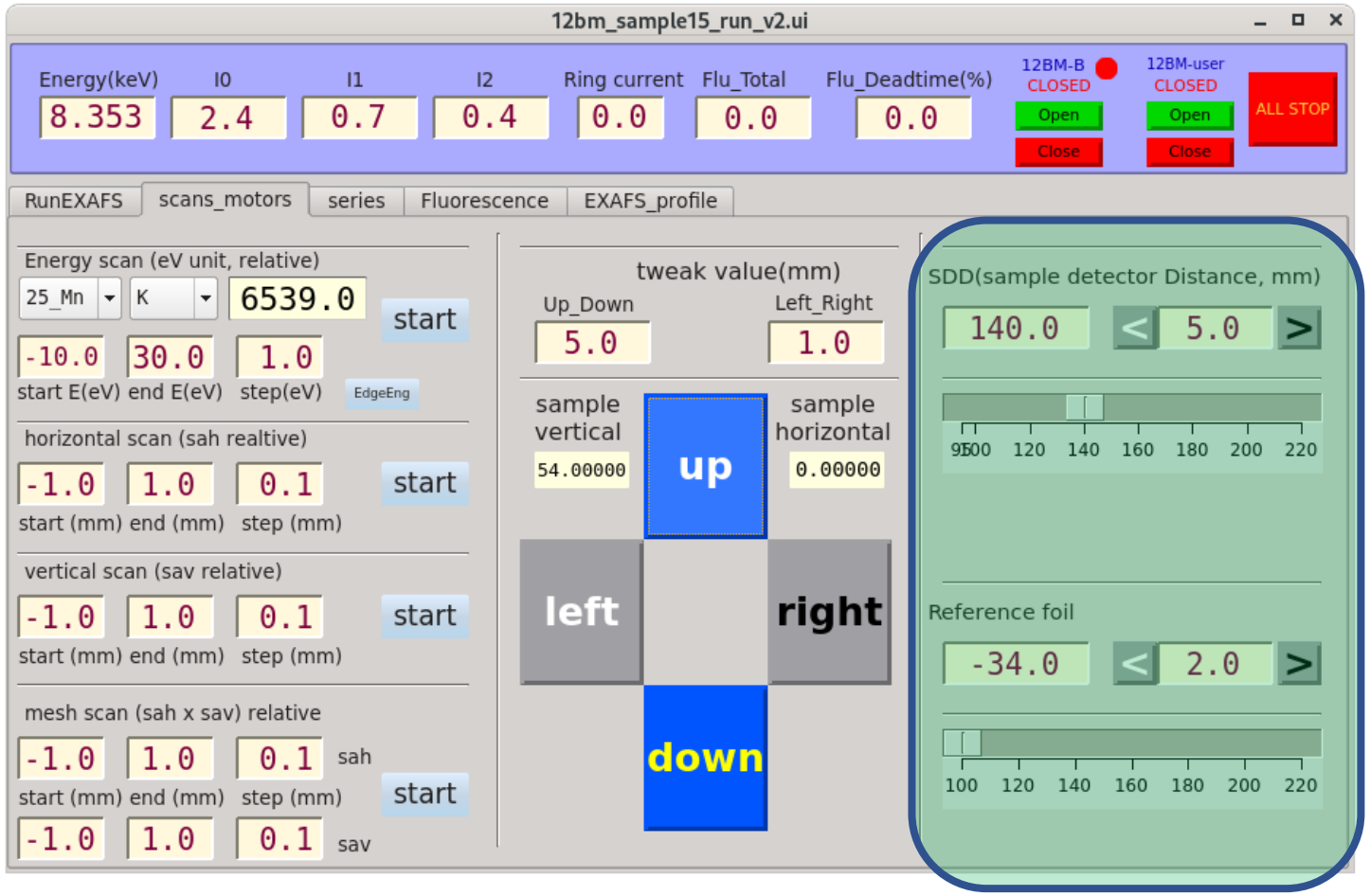


  - Beamline Cameras show directions



12bm_sample15_run Walk Thru

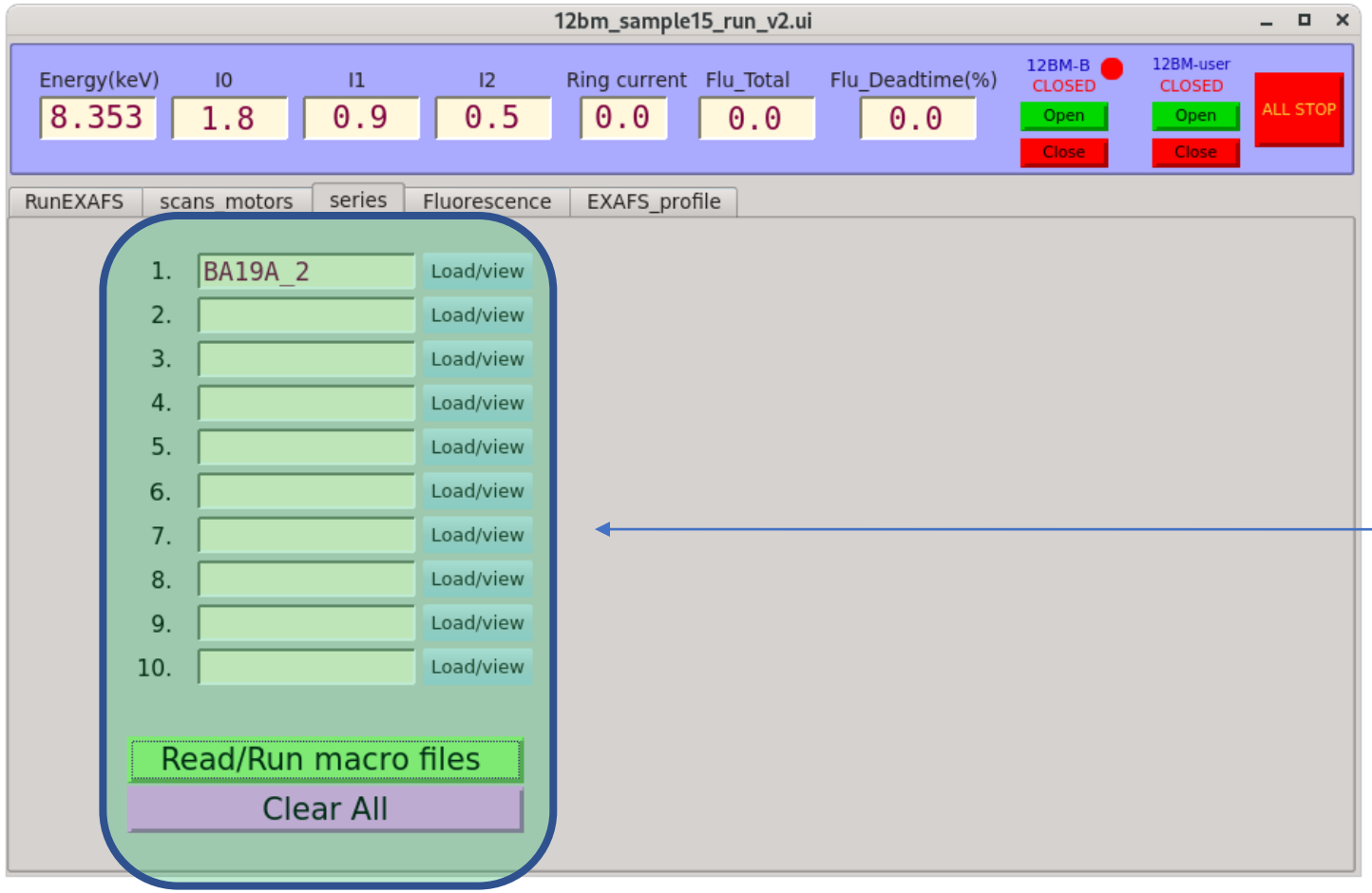
Tab 2 (scans_motors)



- SDD - Move the Detector relative to the sample (140mm away to 50mm away)
- Reff - Move to the Reference Foil 6 Slots available so 6 foils can be placed in the reference holder.

12bm_sample15_run Walk Thru

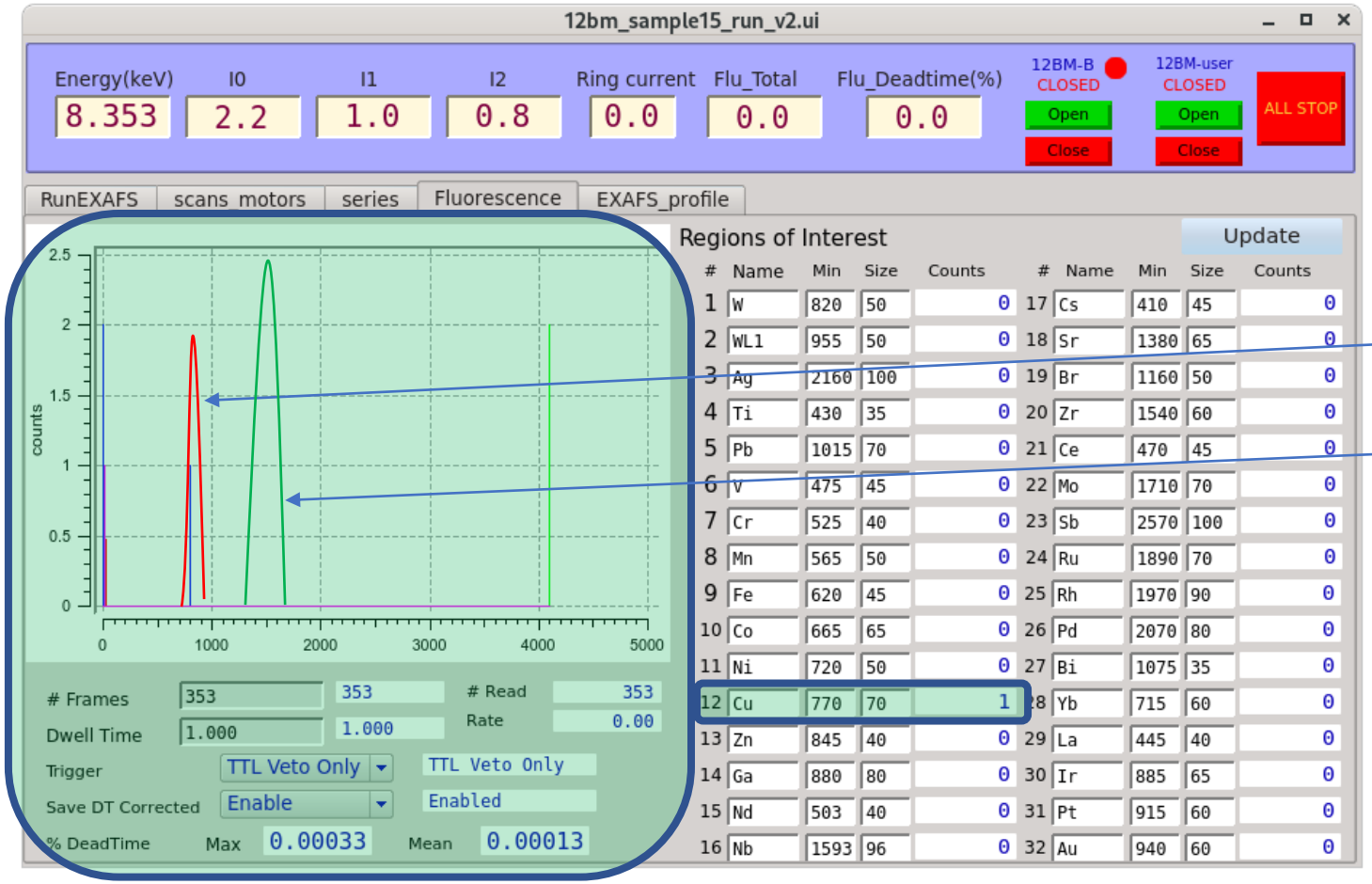
Tab 3 (series)



- Series Run
  - From Tab 1 enter Frame data
  - Then save_to_macro
- This will give the Frame name
  - Ex. Frame is BA192
  - Series will be BA192_1, BA192_2, etc.
  - Enter each save_to_macro into the series list
- Note: To run EXAFS scans in Series tab click Read/Run macro files
- For Series DON'T use Tab 1 RunEXAFS

12bm_sample15_run Walk Thru

Tab 4 (Fluorescence)



- Fluorescence Detector Window
  - This shows the flatot counts
  - Copper Example
    Region of Interest #12
    XSP_ROI = 12
- See Red peak Min is 770, size is 70
- This is the Copper signal
- See Green peak which is the scattering signal
- This is above the Cu edge hence why there is a Red peak
- If the Energy was below the Cu edge the Red peak would be gone

12bm_sample15_run Walk Thru

Tab 4 (Fluorescence)

- Detector ROI Window
  - ROI (Region Of Interest)
- Use XSP_ROI = #
  - This selects which element of interest. Example below XSP_ROI = 12 (Cu line)
- When updating Min/Size make sure to click the Update to update the detectors ROI values.
- If there is no Element in the list of 32 then you will need to change one of the 32 to be your element. We usually keep the usual elements in the list.

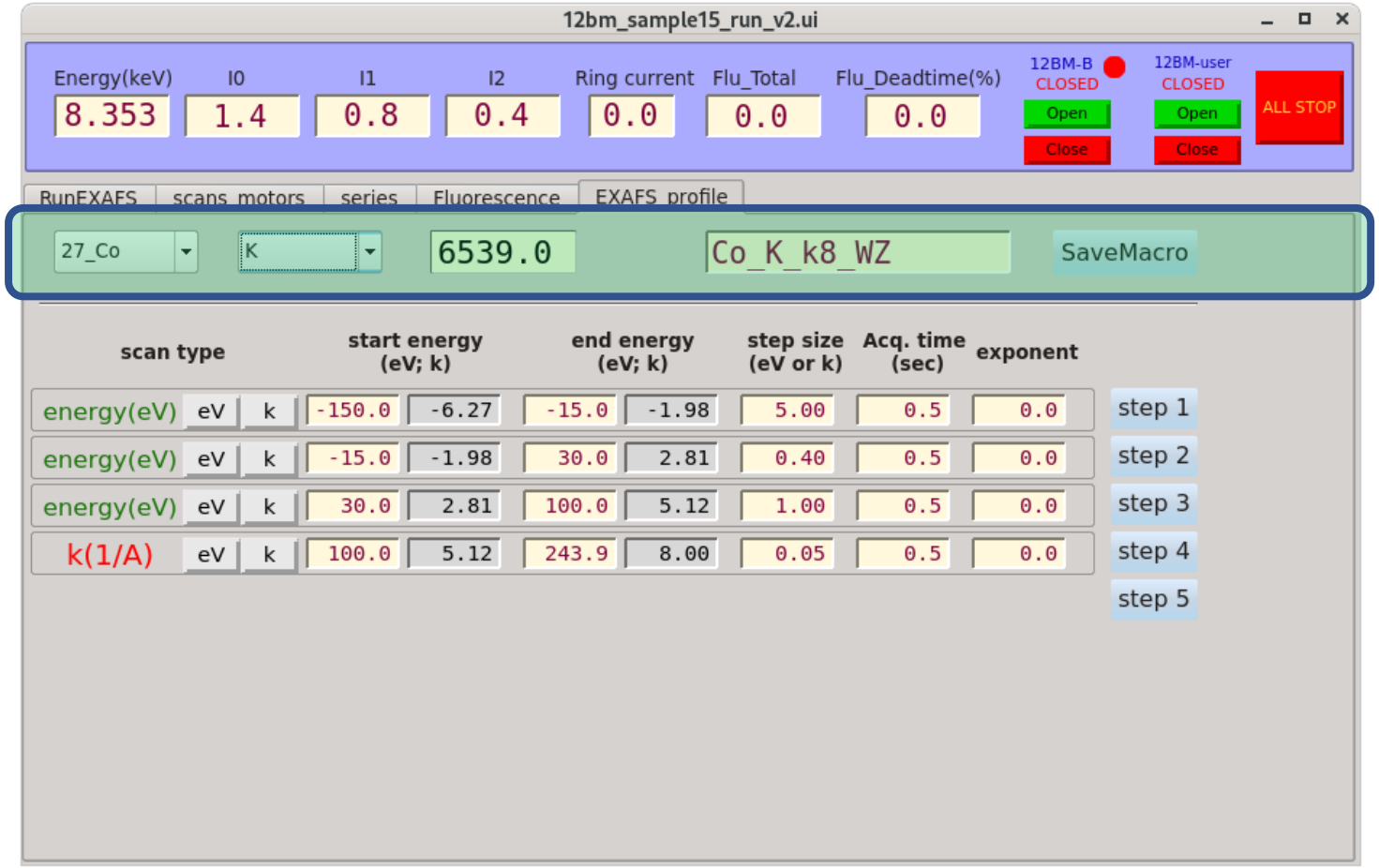
12bm_sample15_run Walk Thru

Tab 5 (EXAFS_Profile)

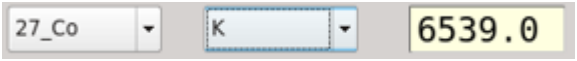
- Setting up exafs_macro for a scan
- XANES typically is as follows
  - -150 to -15 pre-edge (E) step 1
  - -15 to 30 edge (E) step 2
  - 30 to 8 post-edge (k) step 4
- EXAFS typically is as follows
  - -200 to -15 pre-edge (E)
  - -15 to 30 edge (E)
  - 30 to 12-15 post-edge (k)
- Always have the post edge in k(1/A) for better resolution in data.
- This example has 4 steps with an extra scan type. Click step 4 to delete it
- Next Slide sets up to save this macro

12bm_sample15_run Walk Thru

Tab 5 (EXAFS_Profile)



- Select the Element under study, the correct edge and make sure the energy is correct.

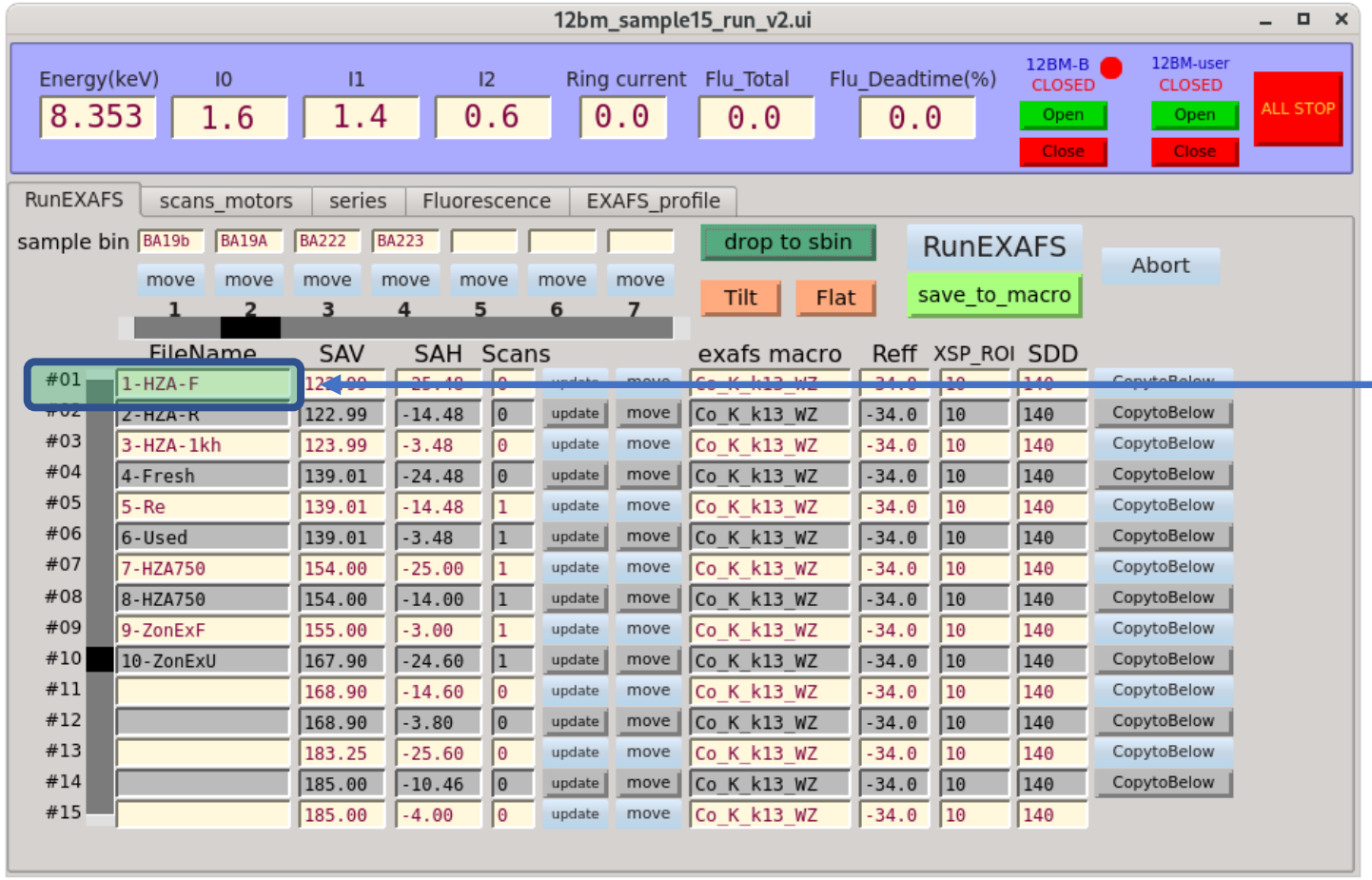


- Name the Macro and save it

- This will be the macro you enter into Tab 1 (exafs macro) column
- These get saved into your data folder so you have them for the next experiment time under “xafs_macro_list_date”

12bm_sample15_run Walk Thru

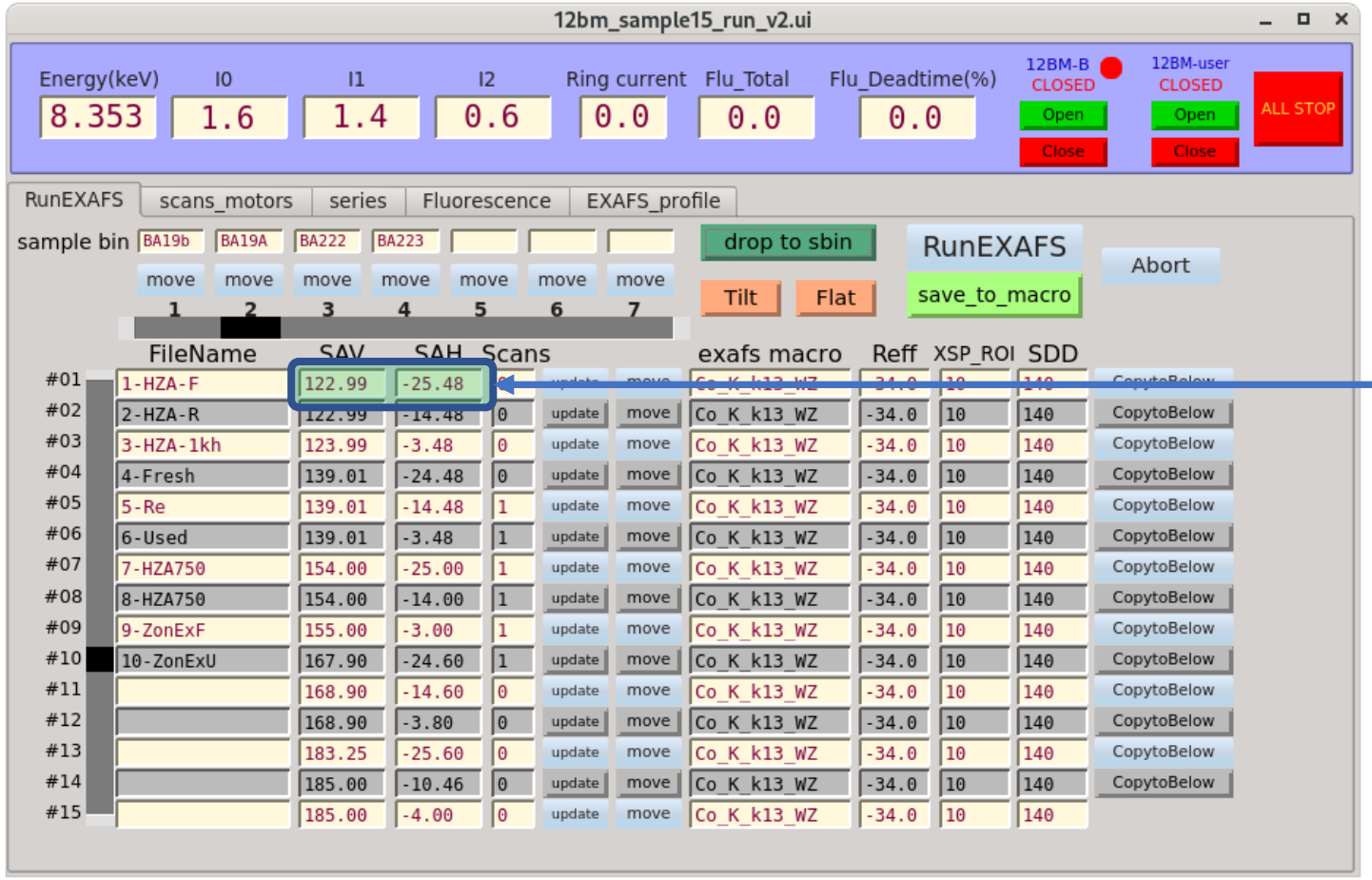
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)

12bm_sample15_run Walk Thru

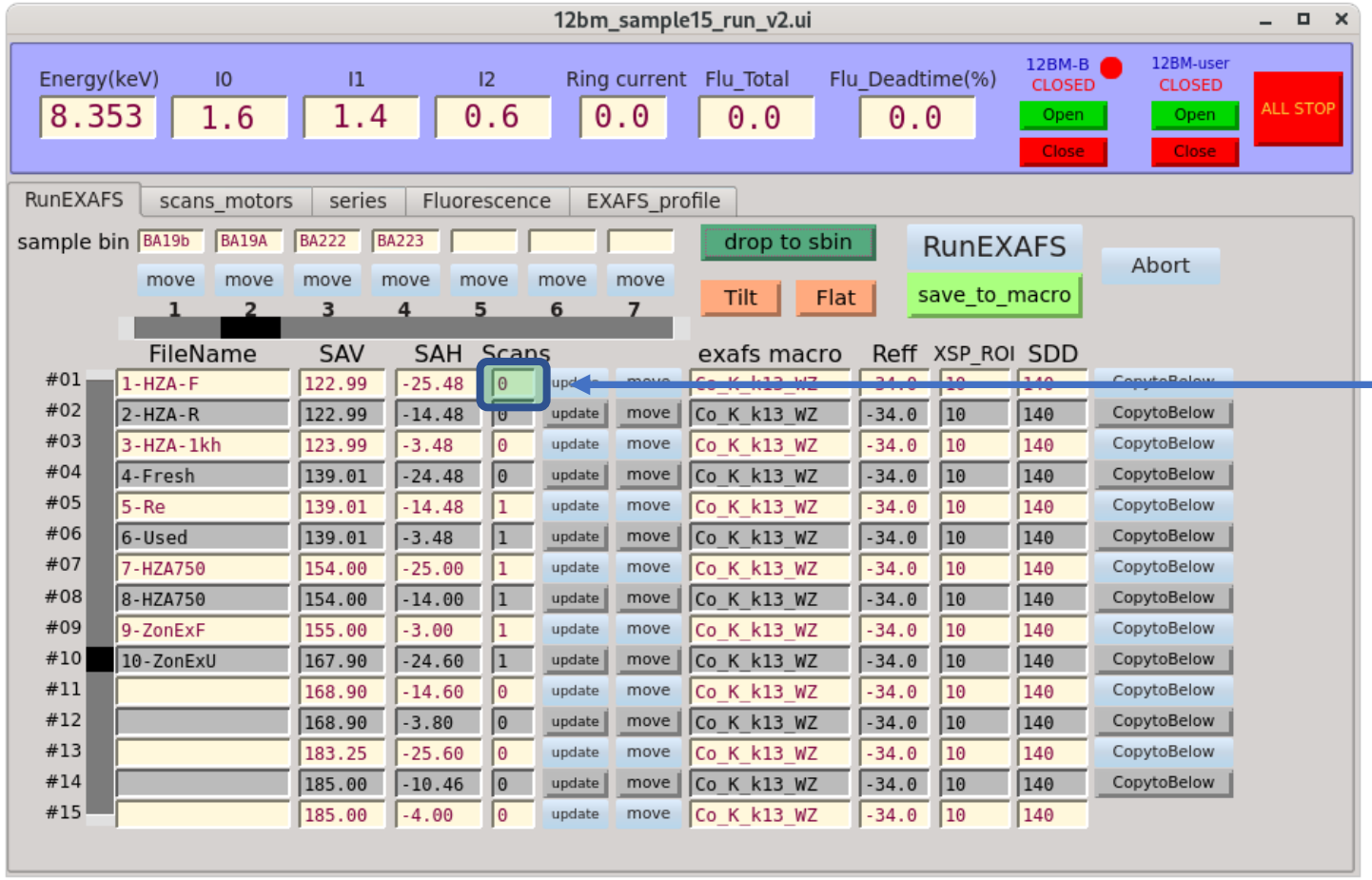
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal

12bm_sample15_run Walk Thru

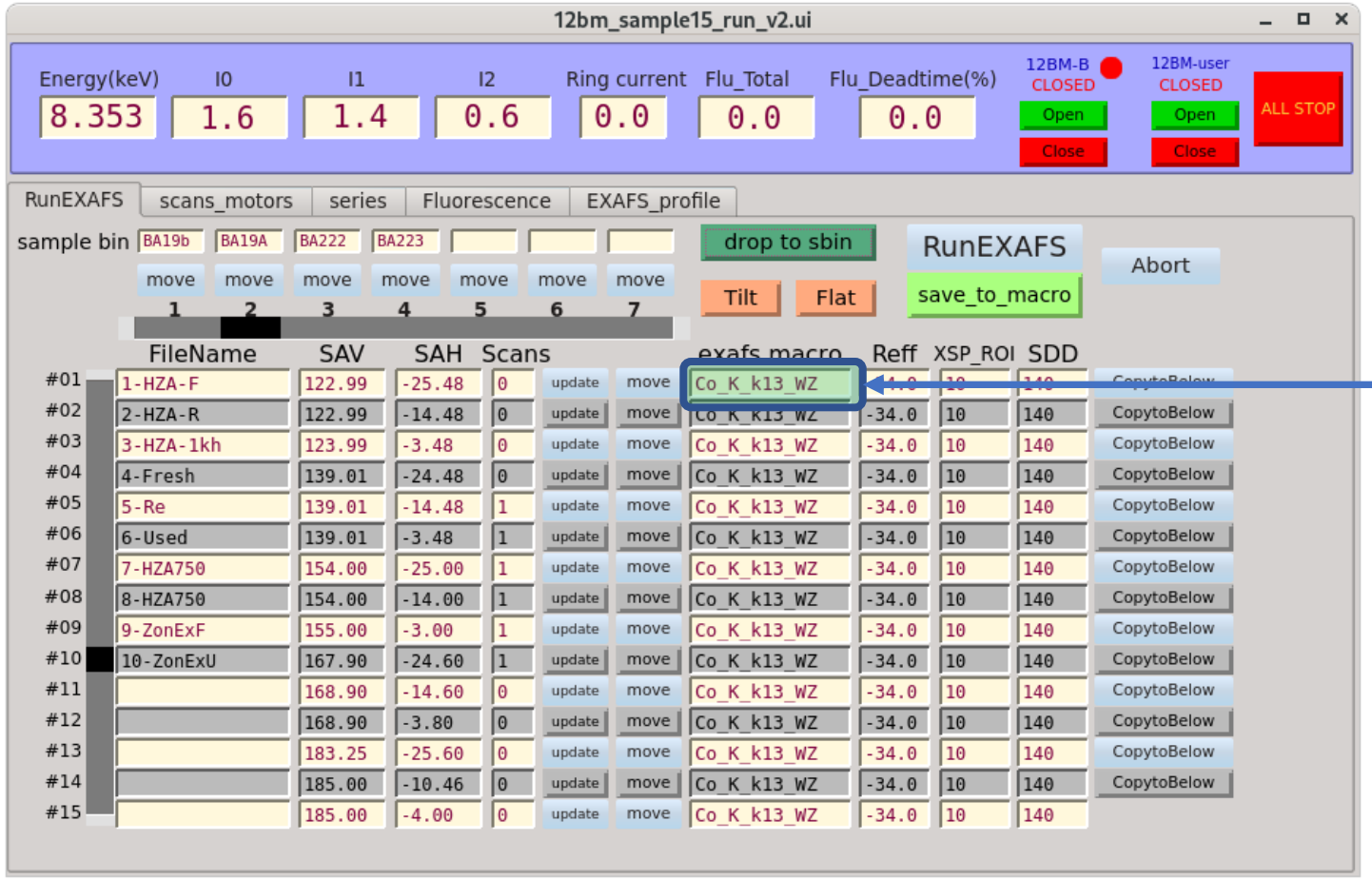
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal
  3. Enter amount of scans needed

12bm_sample15_run Walk Thru

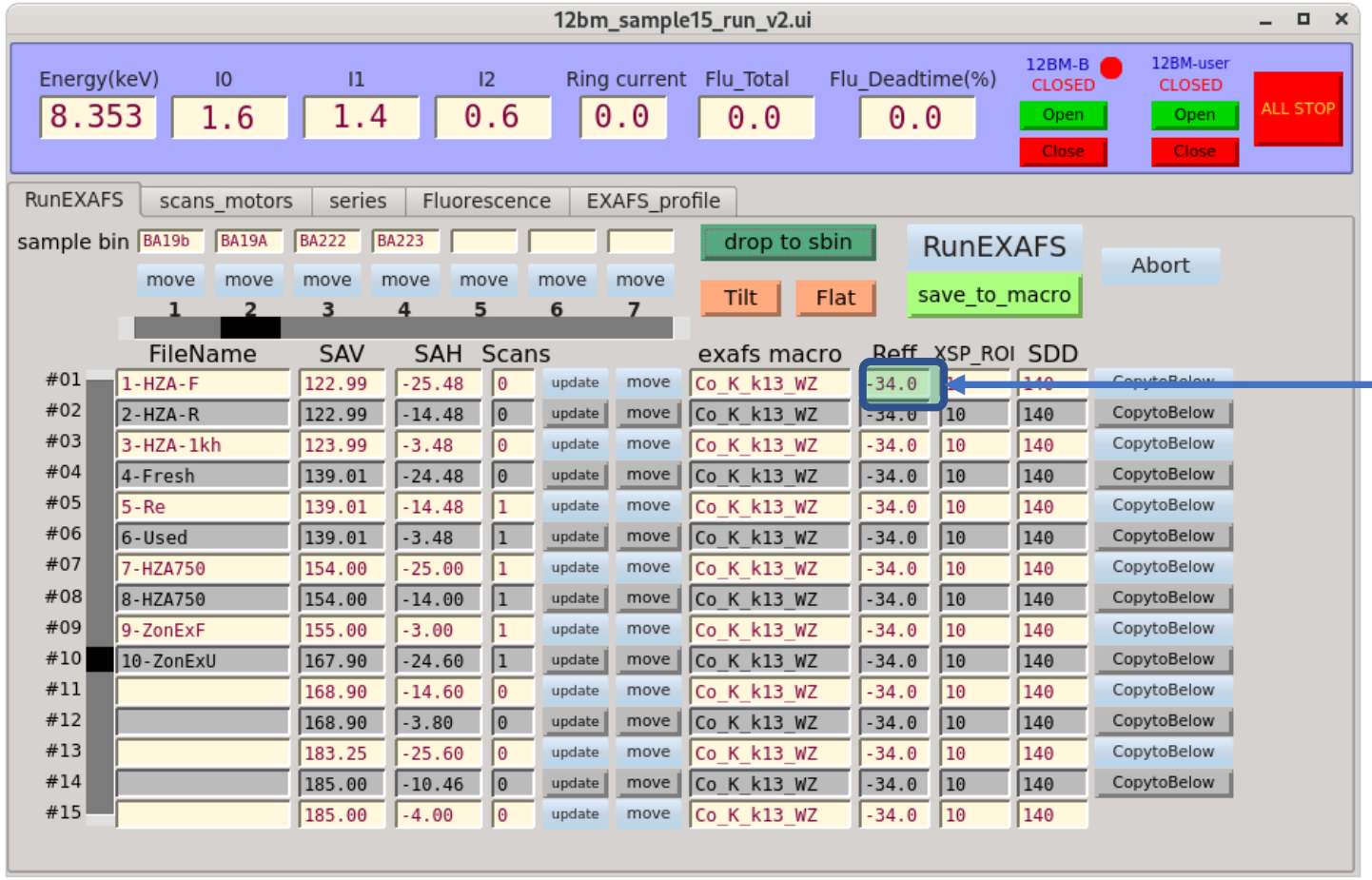
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal
  3. Enter amount of scans needed
  4. Create exafs_macro (Tab 5)

12bm_sample15_run Walk Thru

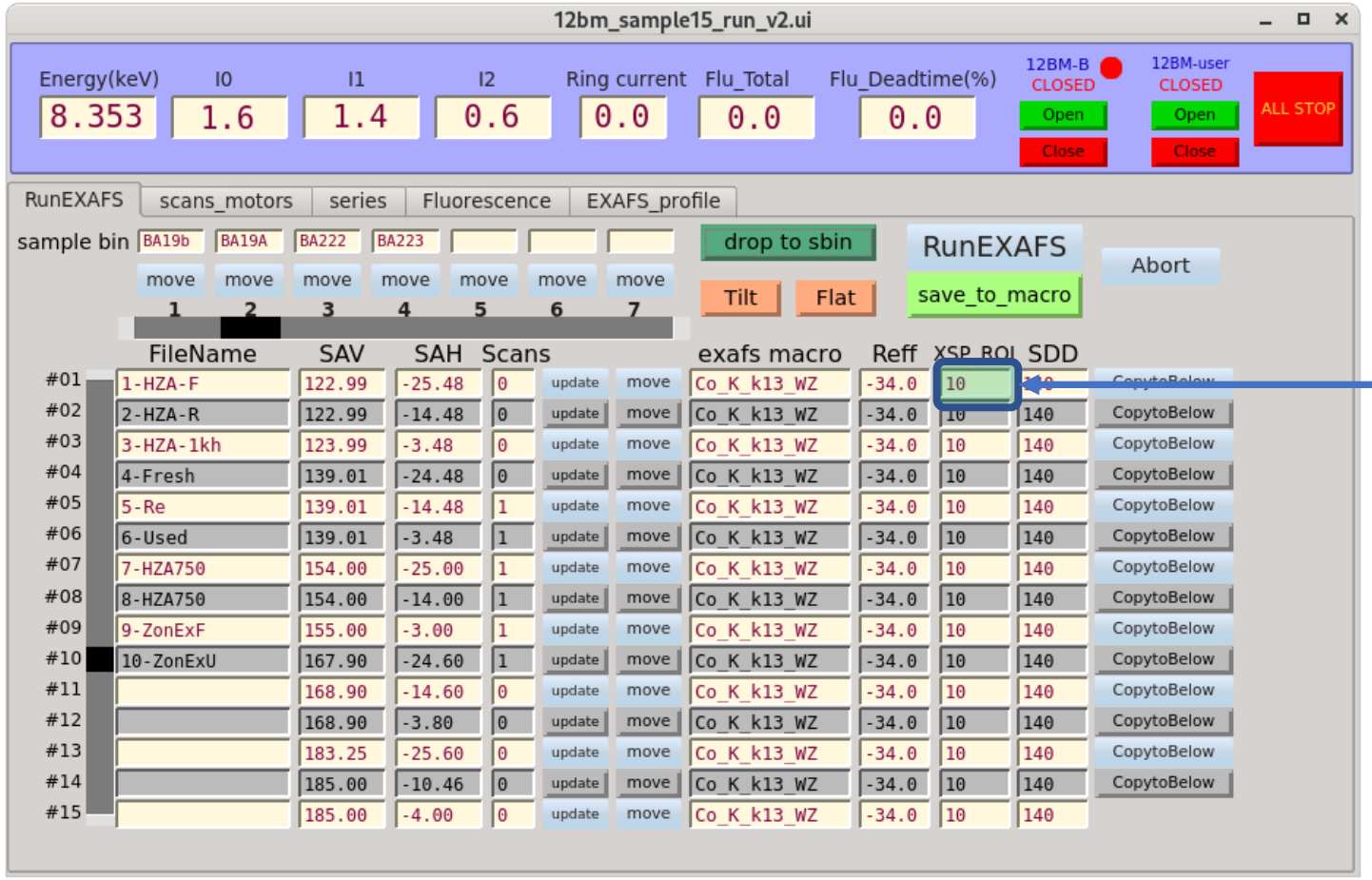
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal
  3. Enter amount of scans needed
  4. Create exafs_macro (Tab 5)
  5. Make sure Reff position is correct for the element (Tab 2)

12bm_sample15_run Walk Thru

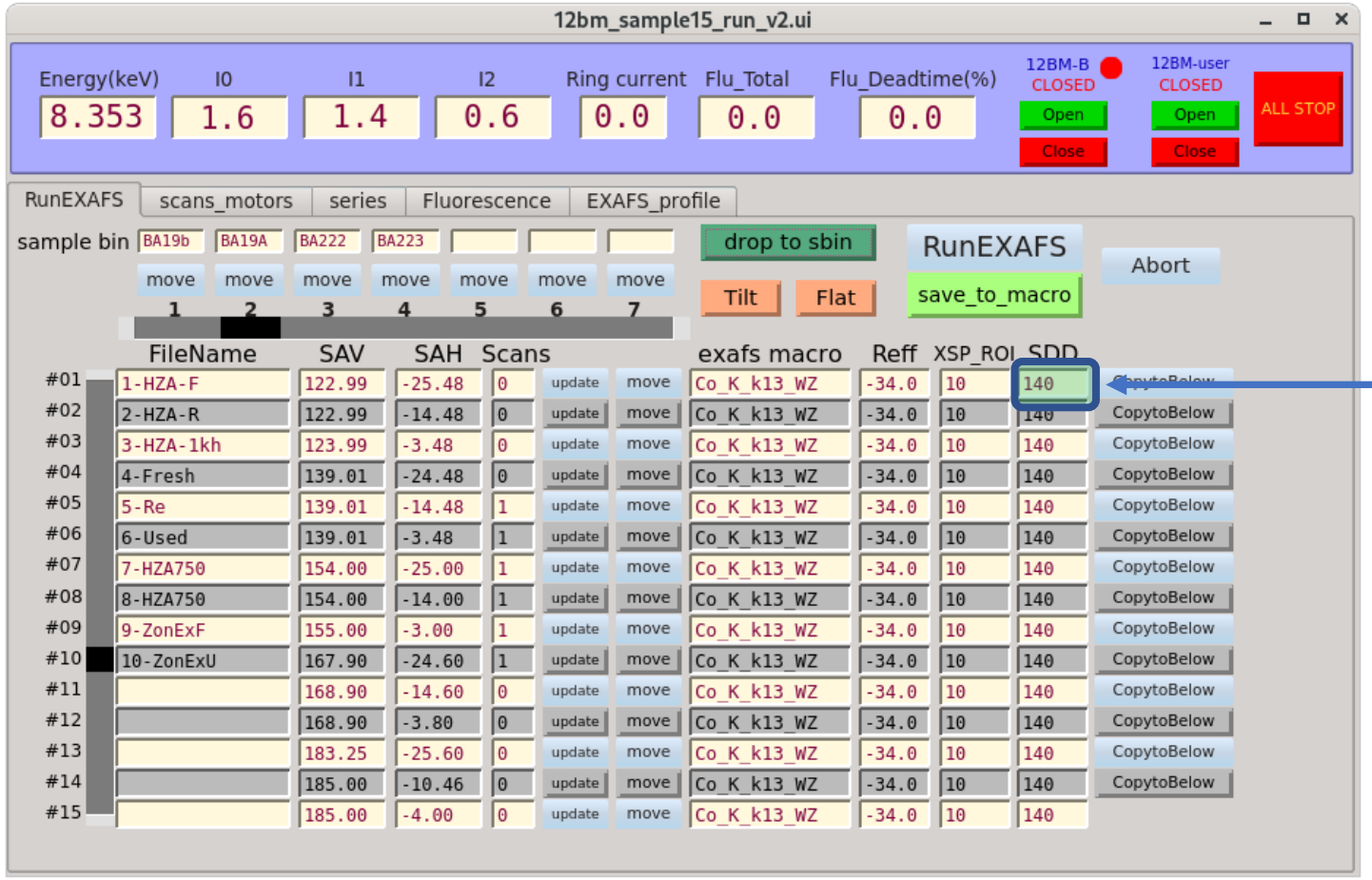
Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal
  3. Enter amount of scans needed
  4. Create exafs_macro (Tab 5)
  5. Make sure Reff position is correct for the element (Tab 2)
  6. Make sure correct XSP_ROI for the element under study (Tab 4)

12bm_sample15_run Walk Thru

Step by Step for Sample Input



- **Step by Step for sample Input**
  1. Input FileName for your Sample (Tab 1)
  2. Make sure SAV/SAH are correct meaning good fluorescence signal
  3. Enter amount of scans needed
  4. Create exafs_macro (Tab 5)
  5. Make sure Reff position is correct for the element (Tab 2)
  6. Make sure correct XSP_ROI for the element under study (Tab 4)
  7. Enter correct SDD from (Tab 2) so the Flu_Deadtime is <2.5%
  8. Click CopytoBelow to fill in all cells below with same parameters

12bm_sample15_run Walk Thru
Typical commands

- **Experimental Station**
  - sbo (station b open)
  - sbc (station b close)
- **Quick Shutter**
  - shopen (shutter open)
  - shclose (shutter close)
- **Sample Stage** (sah = sample horizontal, sav = sample horizontal)
  - umvr sah 3 (moves sample stage horizontal 3mm relative to present position)
  - umv sav 4.5 (moves sample stage vertically 4.5mm absolute)
  - wm sah (where motor sah)
  - wa (shows all motor positions)
- **Sample Scan**
  - lup sah -5 5 60 0.1 (lup ? on command line to see parameters)
- **Create newfile**
  - newfile testrun_01

12bm_sample15_run Walk Thru
Typical commands

- **Energy**
  - getE (shows energy of mono - in keV)
  - CentEng(12.0) (Centers mono stage at 12keV)
  - moveE (moves the energy)
- **Mostab - (Mono stabilization)**
  - mt_ph (feedback set to rocking curve peak)
  - mt_man (puts feedback into manual mode)
- **Reading Counts**
  - ct (shows counts of all the detectors on during the experiment)