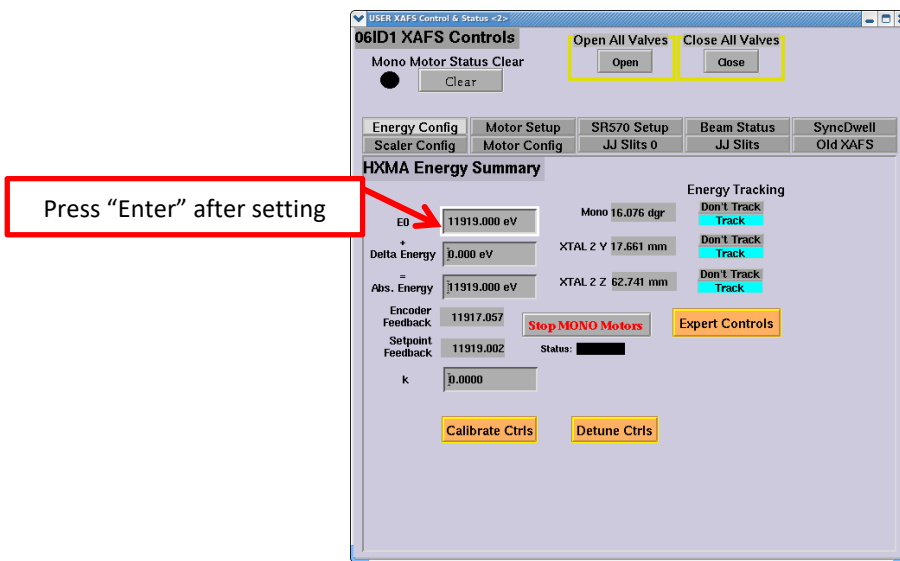


## HXMA Mono Energy Calibrate

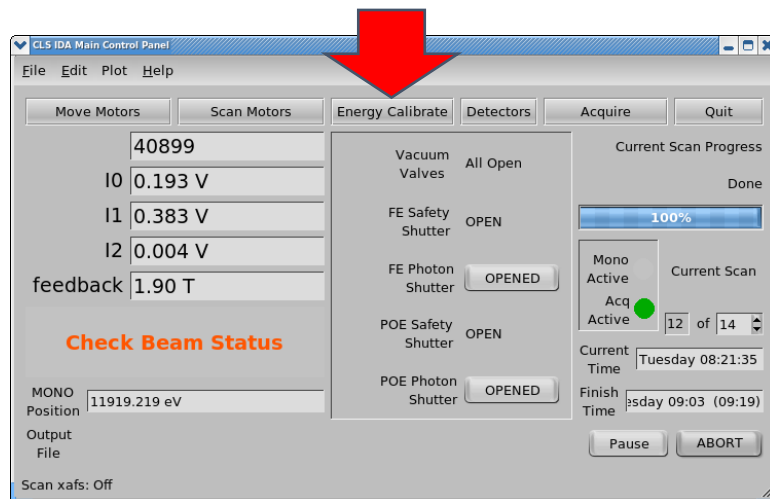
1. Set the mono to the desired energy by setting “E0” to the targeted edge energy (in eV), and hit enter.

**Note:** if the current E0 is far away from target E0, change E0 gradually. For example, target E0 is 11919 eV, current E0 is 7112 eV, change E0: 1) 8000 eV (hit enter); 2) 9000 eV (hit enter); 3) 10000 eV (hit enter) 4) 11919 eV.

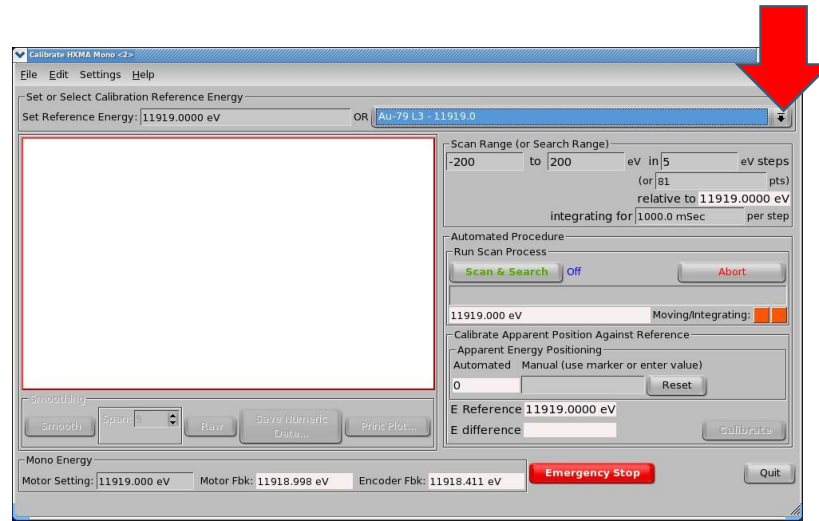
2. Wait until all the motors stop to finish the process. This can take at most a few minutes if the change is significant.



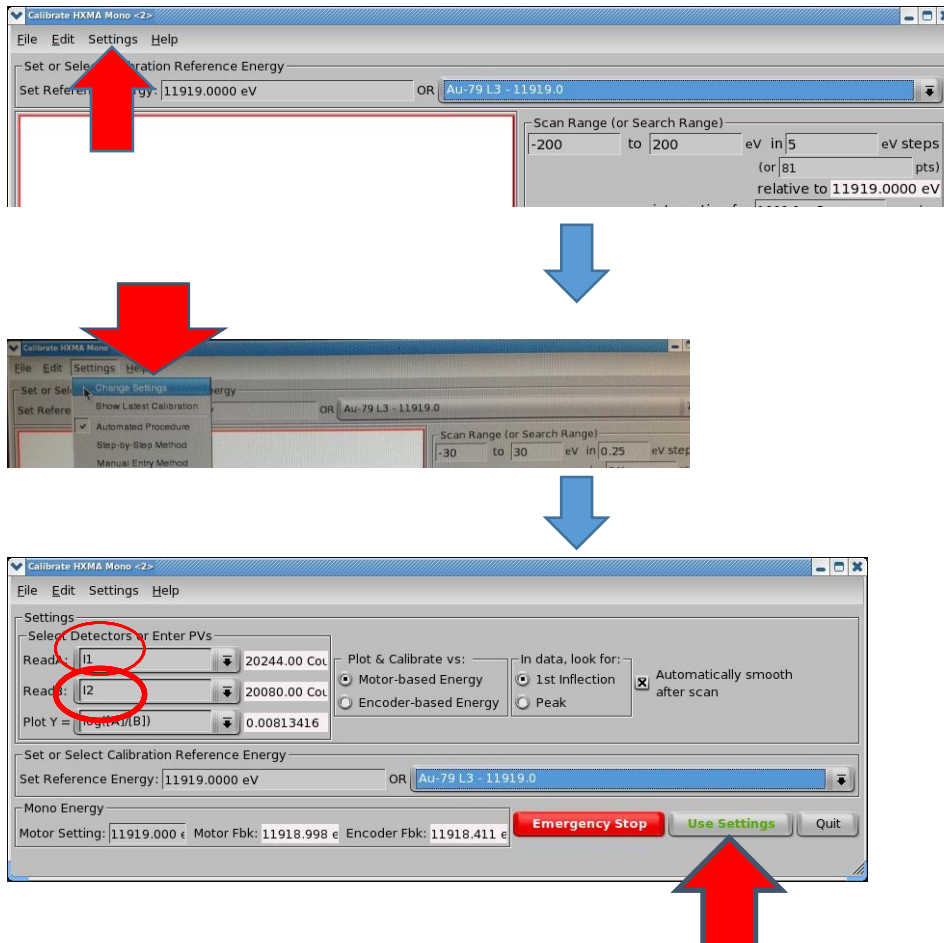
3. Select “Energy Calibrate” from IDA software



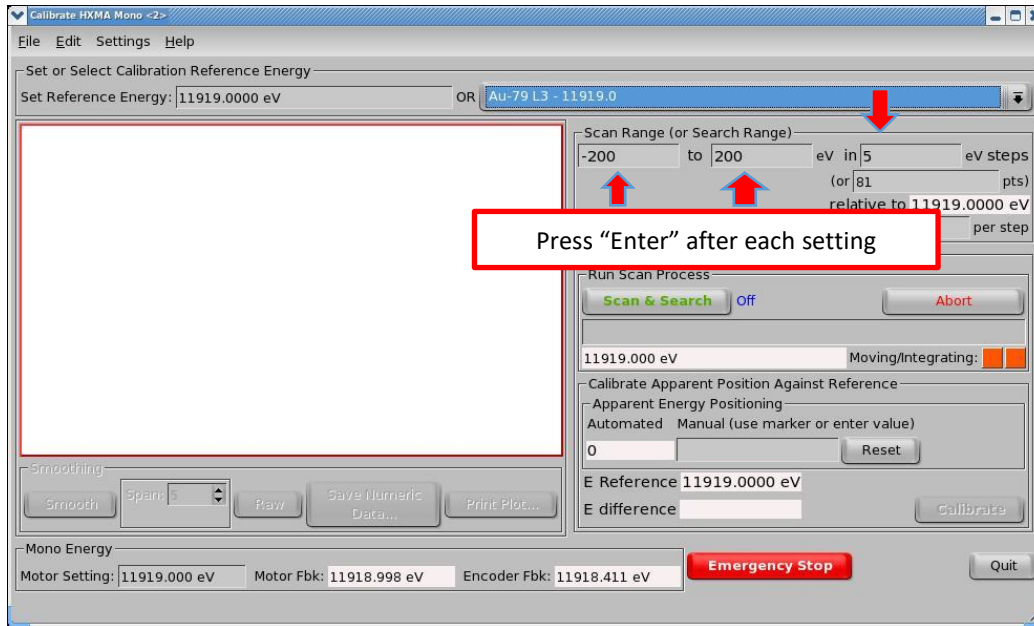
4. Select the desired element and corresponding edge by pointing the arrow of the mouse



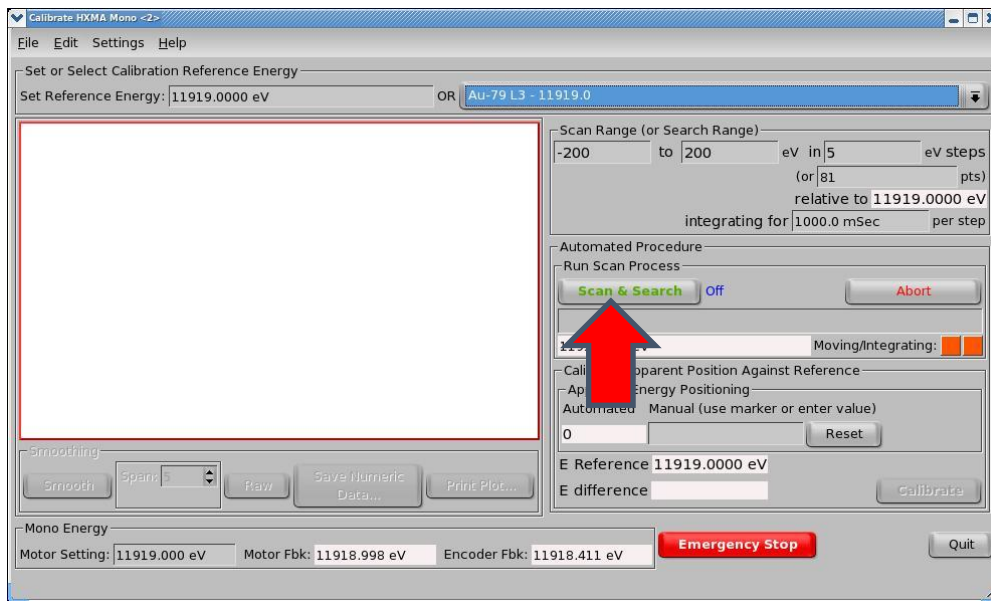
5. Metal foil is usually positioned between  $I_1$  and  $I_2$ . If not, reset detectors accordingly through “Settings”- “Change setting”



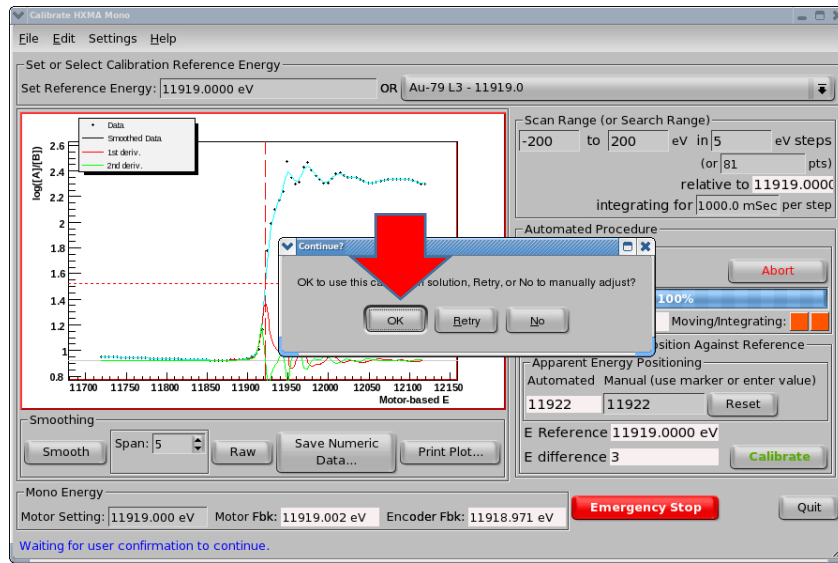
6. In case there is large uncertainty in mono energy, calibration configuration can be reset through “Use settings”. Main menu will come out, e.g., (-200, 200, 5). If not, skip the step 6, 7 and 8.



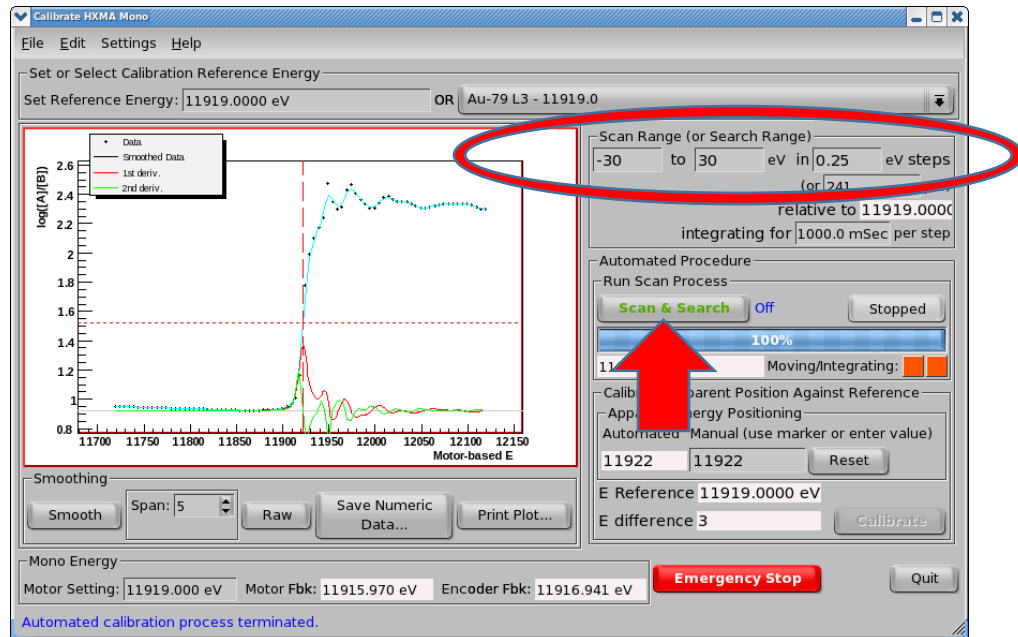
7. Click “Scan & Search”



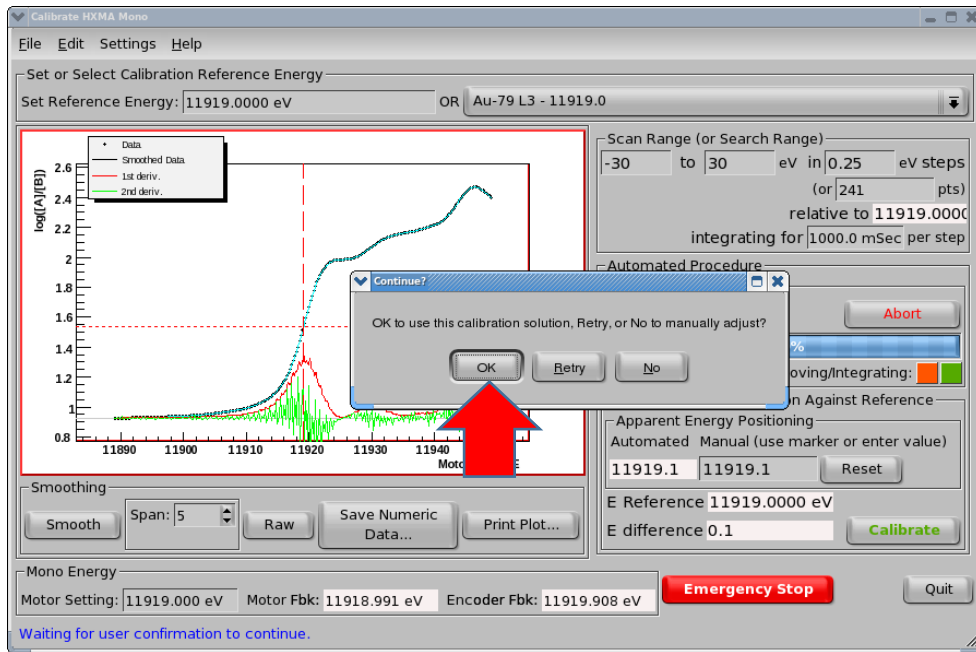
8. If accepting the solution resolved by the calibration software, select “OK”



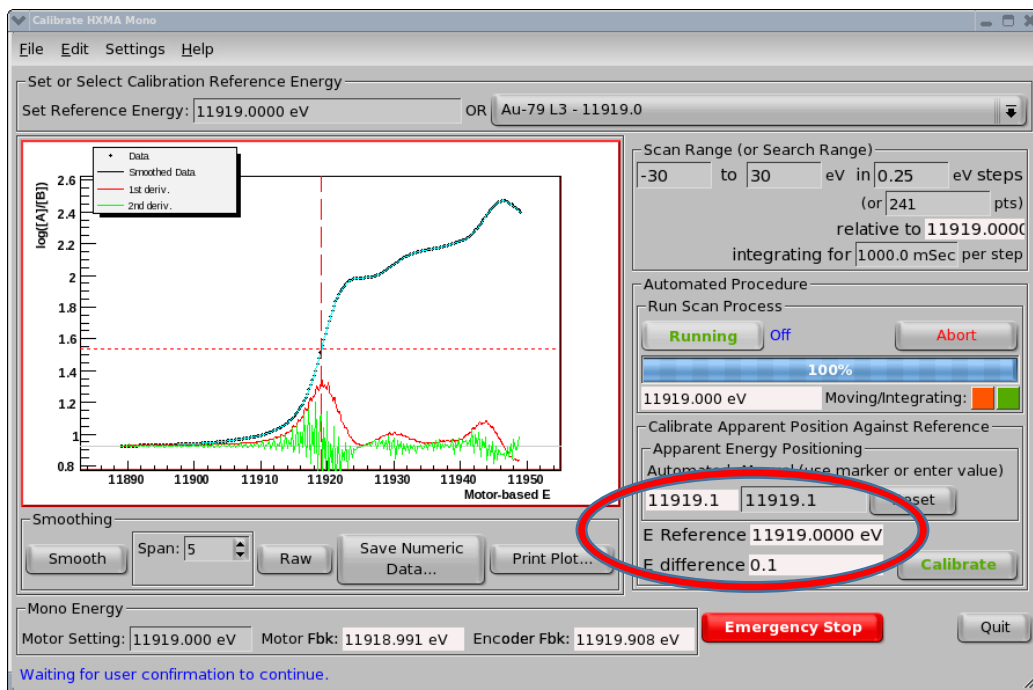
9. Energy calibration using the default configuration (-30, 30, 0.25), click “Scan & Search”



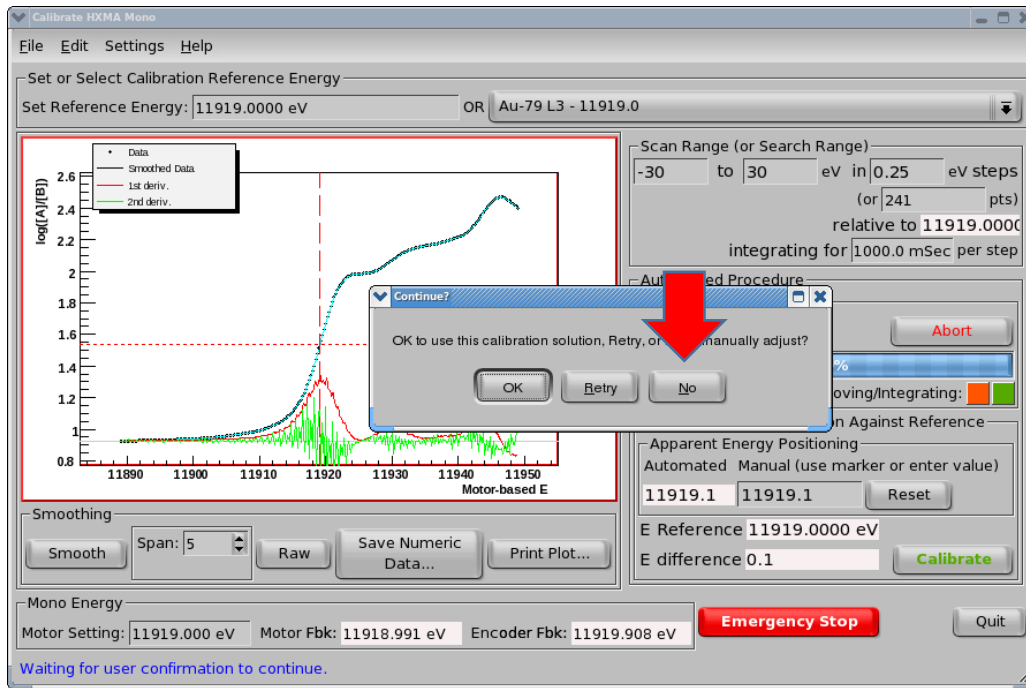
10. Then you can get this figure, click “OK” if you accept the position



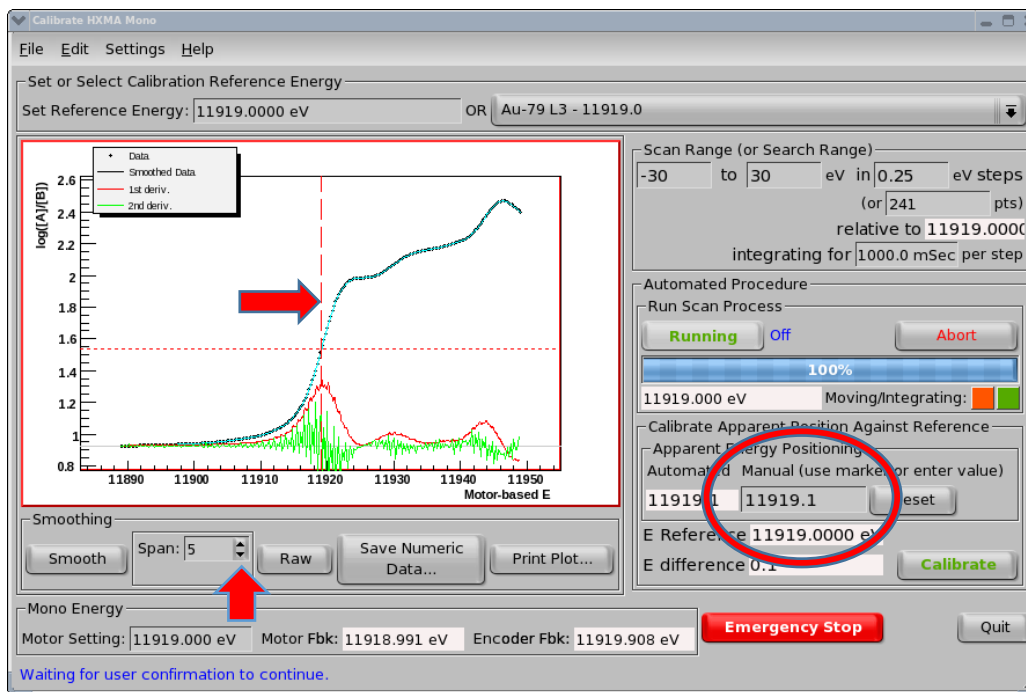
11. Then energy calibrate is done.



12. If you do not accept the software solution, select “no”



13. Progressively changing the data points used for smoothing the graph using the up and down arrows at the “Span” button, and monitor whether the  $E_0$  indicated by the first derivative of the collected XANES spectrum (red) is changed, moving the vertical bar to the resolved  $E_0$  position if necessary.



14.If changing is little or ignorable, select “calibrate energy”

The screenshot displays the 'Calibrate HXMA Mono' software interface. At the top, there is a menu bar with 'File', 'Edit', 'Settings', and 'Help'. Below the menu bar, a section titled 'Set or Select Calibration Reference Energy' contains a text input field with '11919.0000 eV' and a dropdown menu showing 'Au-79 L3 - 11919.0'. The central part of the interface is a plot with the y-axis labeled 'log(A/B)' ranging from 0.8 to 2.6 and the x-axis labeled 'Motor-based E' ranging from 11890 to 11950. The plot shows four data series: 'Data' (black dots), 'Smoothed Data' (blue line), '1st deriv.' (red line), and '2nd deriv.' (green line). A vertical dashed red line is positioned at approximately 11920 on the x-axis, and a horizontal dashed red line is at approximately 1.5 on the y-axis. Below the plot is a 'Smoothing' section with a 'Smooth' button, a 'Span' dropdown set to '5', and buttons for 'Raw', 'Save Numeric Data...', and 'Print Plot...'. To the right of the plot is a 'Scan Range (or Search Range)' section with input fields for '-30' to '30' eV in '0.25' eV steps, '(or 241 pts) relative to 11919.0000' and 'integrating for 1000.0 mSec per step'. Below this is an 'Automated Procedure' section with a 'Run Scan Process' button, a 'Running' indicator, and an 'Abort' button. A progress bar shows '100%' completion. The 'Calibrate Apparent Position Against Reference' section includes 'Apparent Energy Positioning' with 'Automated' and 'Manual (use marker or enter...)' options, two input fields both set to '11919.1', and a 'Reset' button. Below this are 'E Reference 11919.0000 eV' and 'E difference 0.1' fields, and a 'Calibrate' button. At the bottom, there is a 'Mono Energy' section with 'Motor Setting: 11919.000 eV', 'Motor Fbk: 11918.991 eV', and 'Encoder Fbk: 11919.908 eV'. A red 'Emergency Stop' button and a 'Quit' button are also present. A red arrow points to the 'Calibrate' button. At the bottom left, the text 'Waiting for user confirmation to continue.' is displayed.

