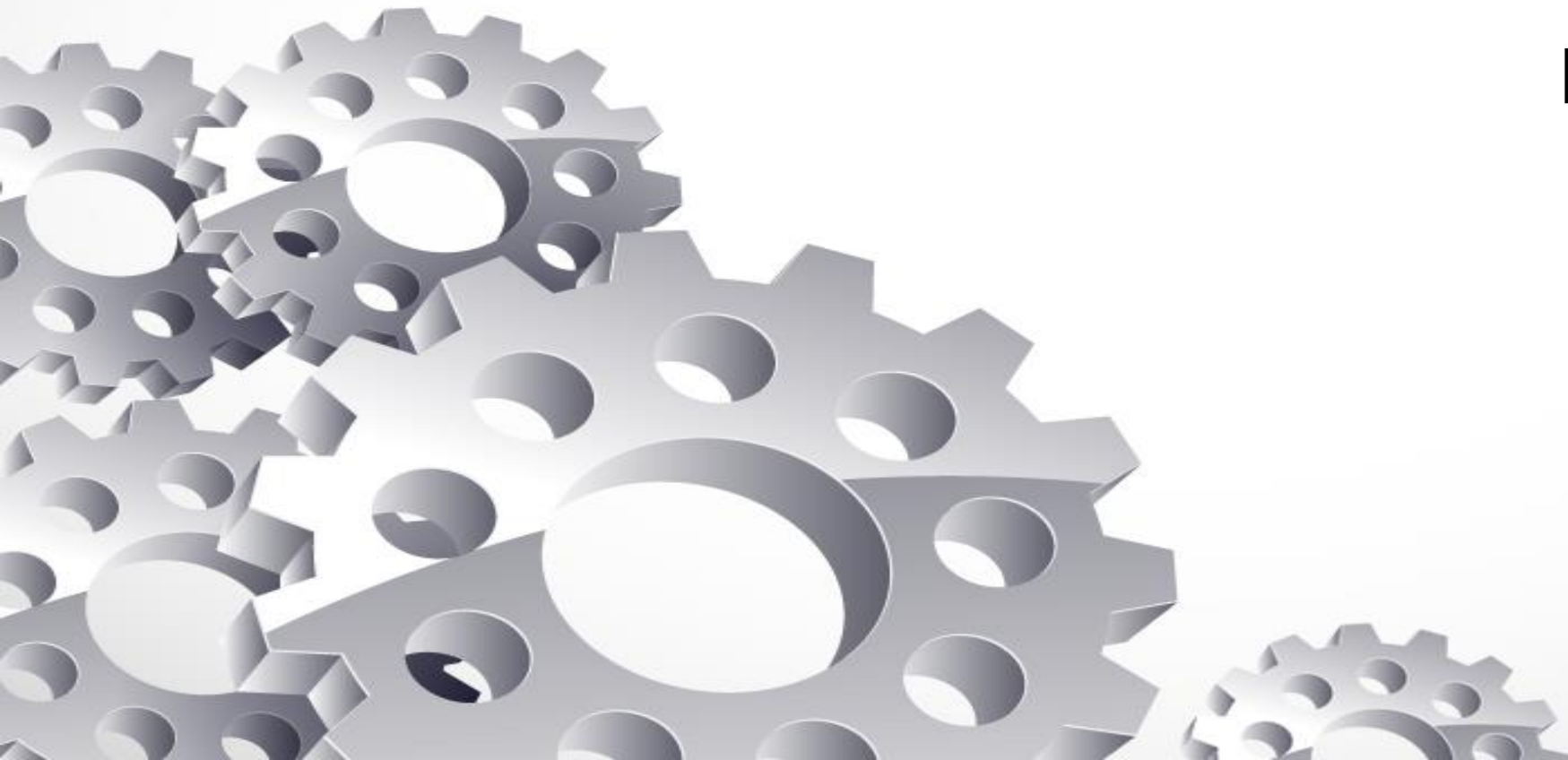


AFM Operation

Haopeng Zhang

Xu group

03/23/2017



Apparatus:

Stage; samples are held and scanned on the AFM stage.



EBox: the EBox sends and receives signals from the computer through a single USB cable.



Front and rear of EBox

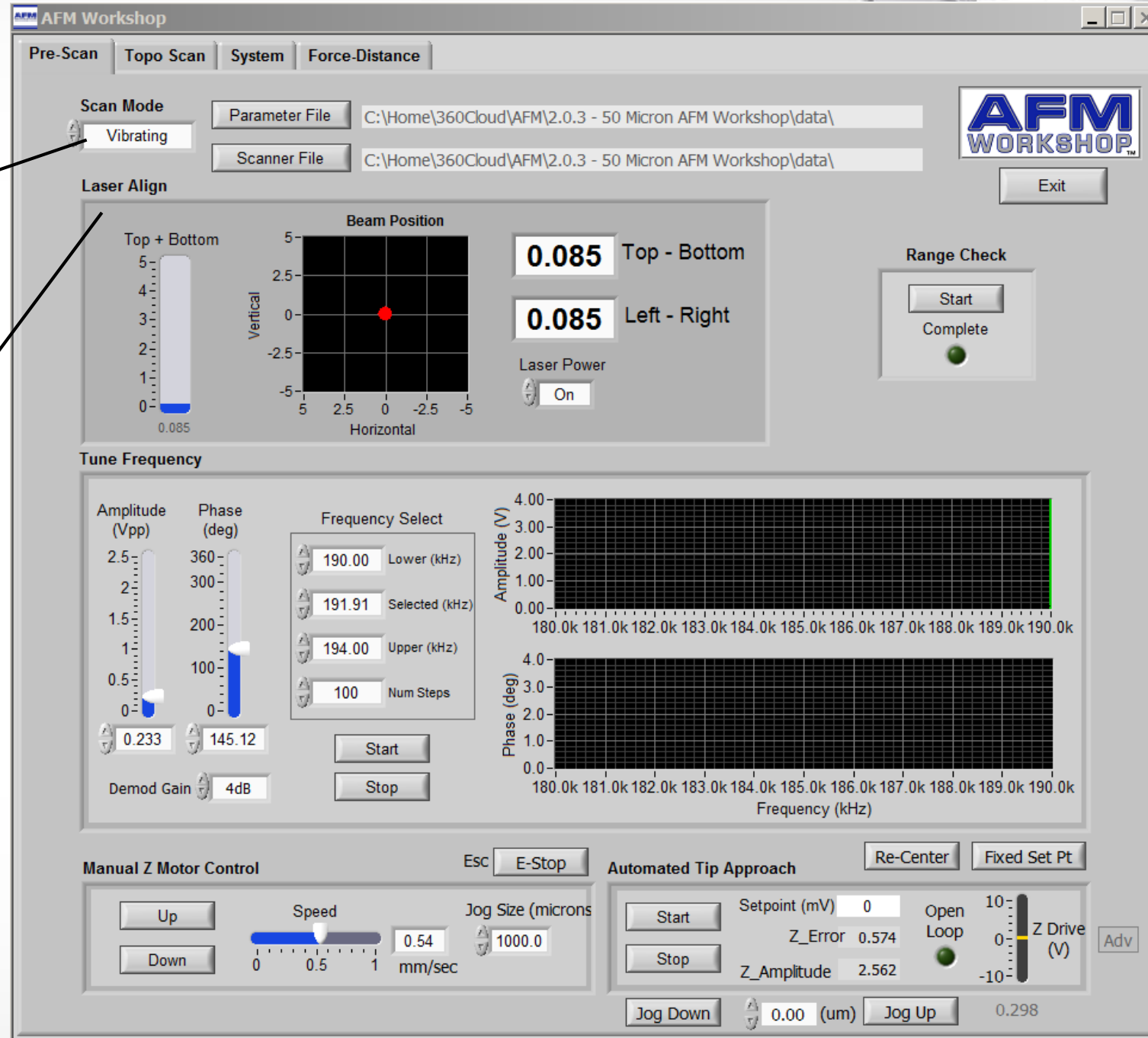


AFM software

Pre-scan window: the pre-scan window contains all of the functions that require adjusting before an image is measured.

Modes: There are two modes: Vibrating mode and Non-vibrating mode(contact mode)

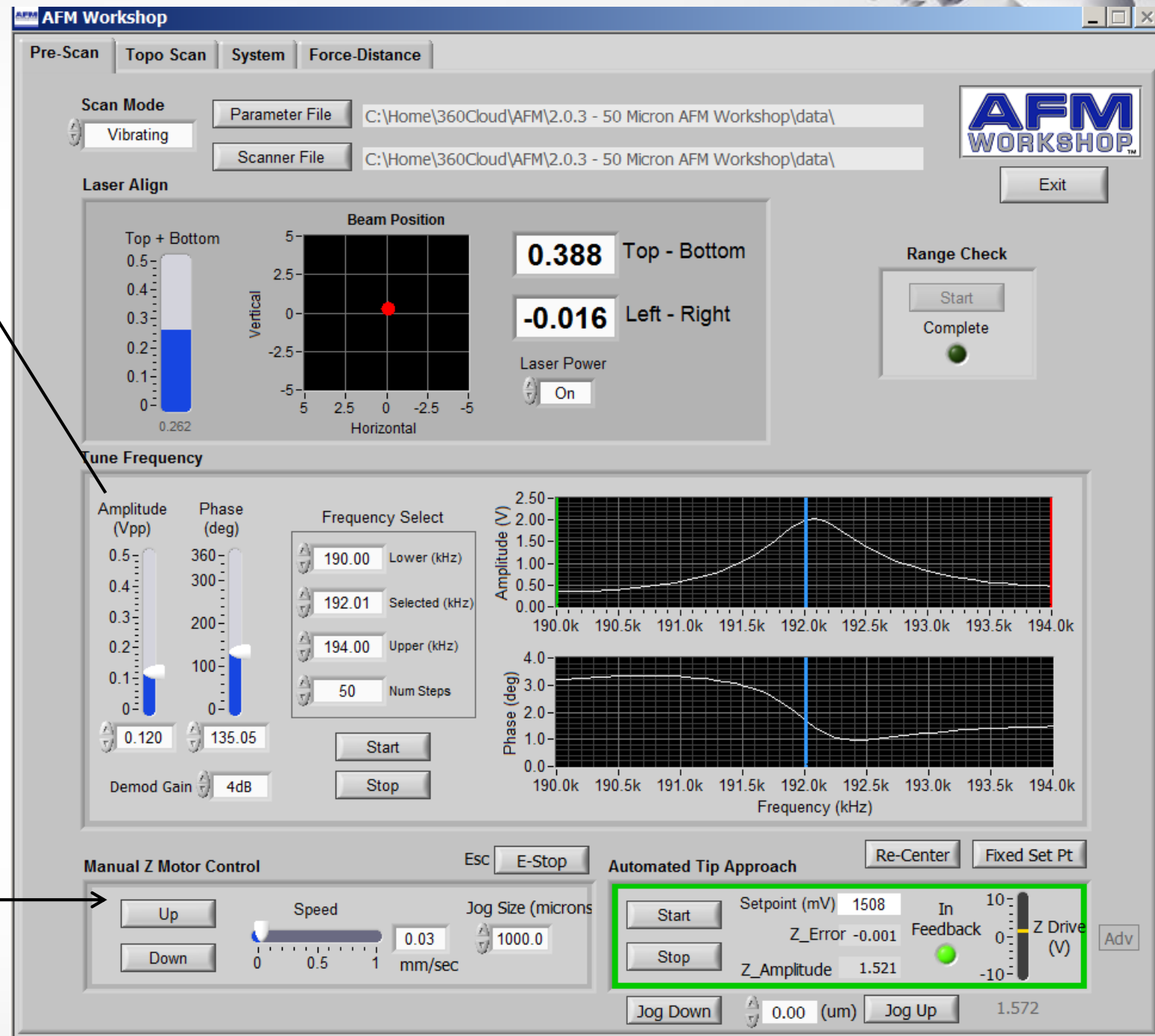
Laser Align: The position of the laser on the four-quadrant photo detector is presented numerically and visually with the Laser Align window.



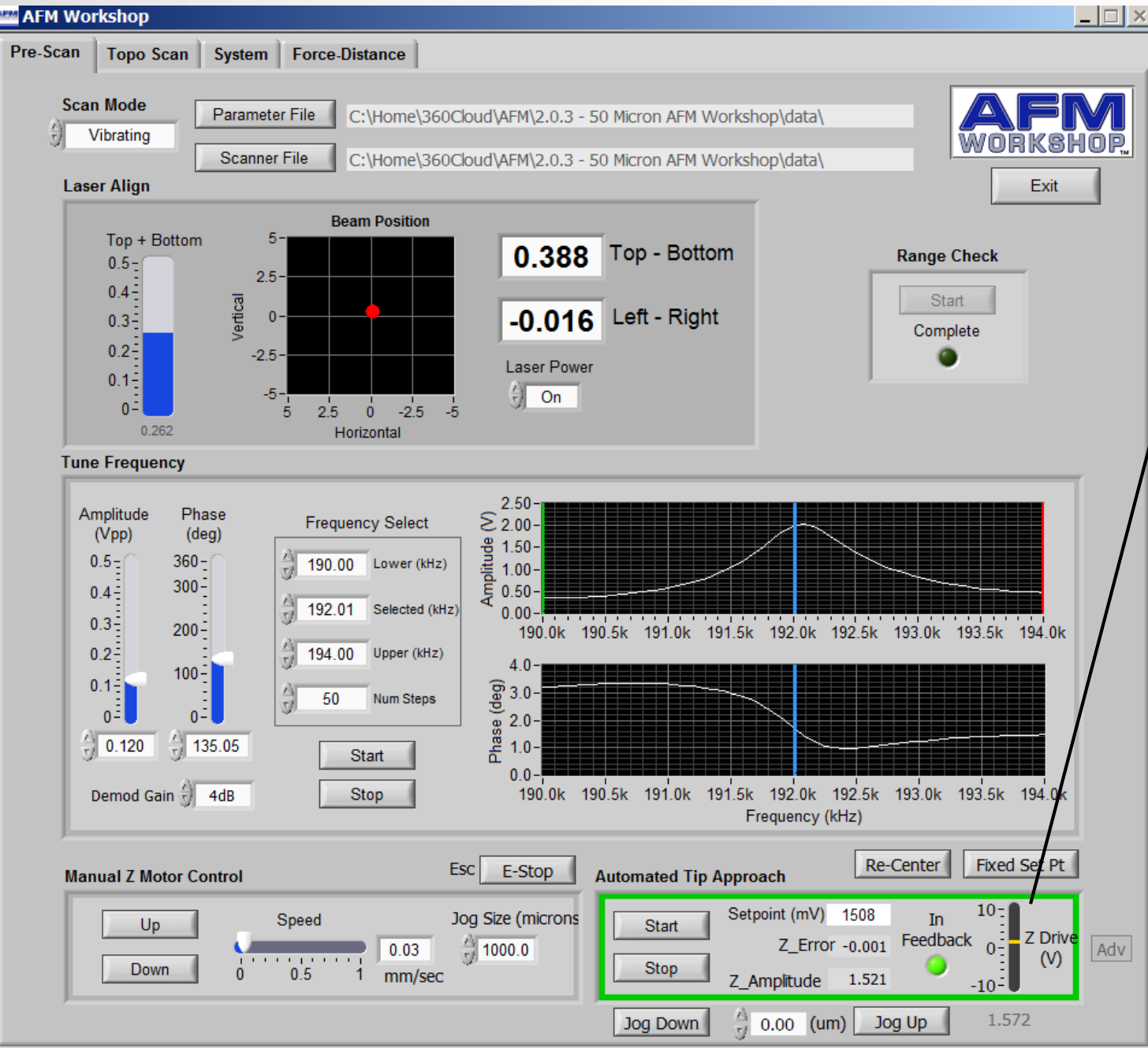
AFM software

Tune Frequency: The tune Frequency window is used for selecting the optimal conditions for making vibrating mode images. there are two oscilloscope windows: the upper window shows the amplitude of the probe's vibration, while the lower window shows the phase between the drive frequency and the measured frequency.

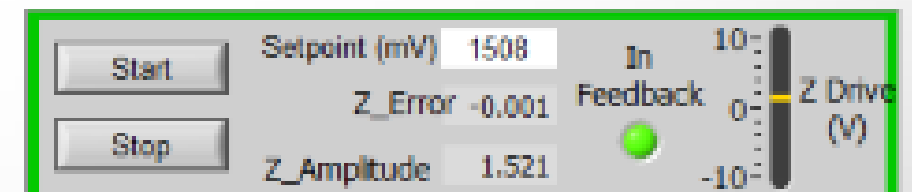
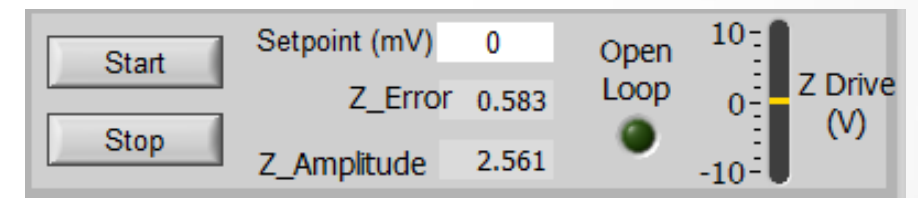
Manual Z Motor Control; The Z motor, which raises and lowers the light lever, is activated with this window. The speed of this motion can be controlled with the speed laser.



AFM software



Automated Tip Approach: The automated tip approach button starts the process of the probe moving toward the surface.

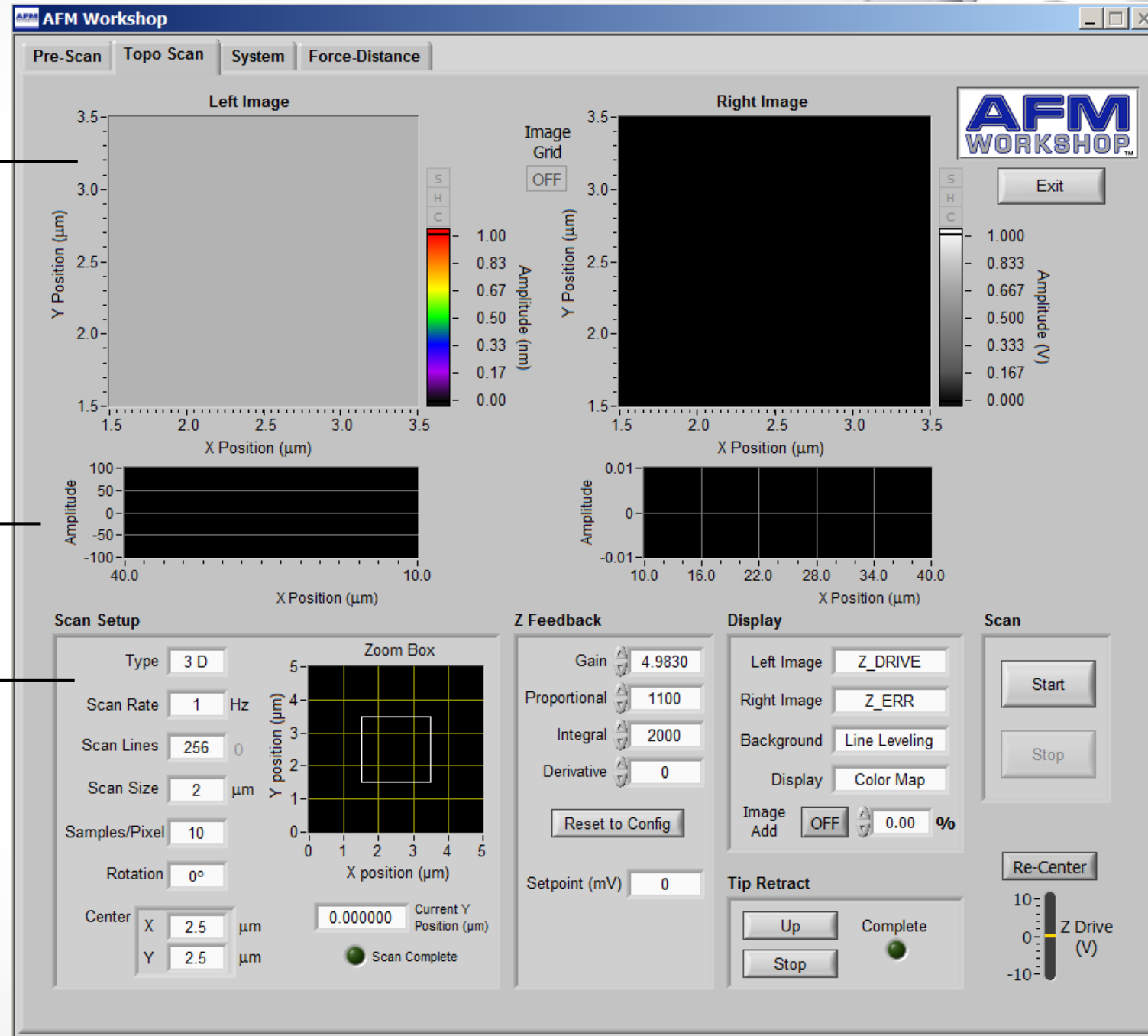


AFM software

Image window: Two images are displayed simultaneously while scanning.

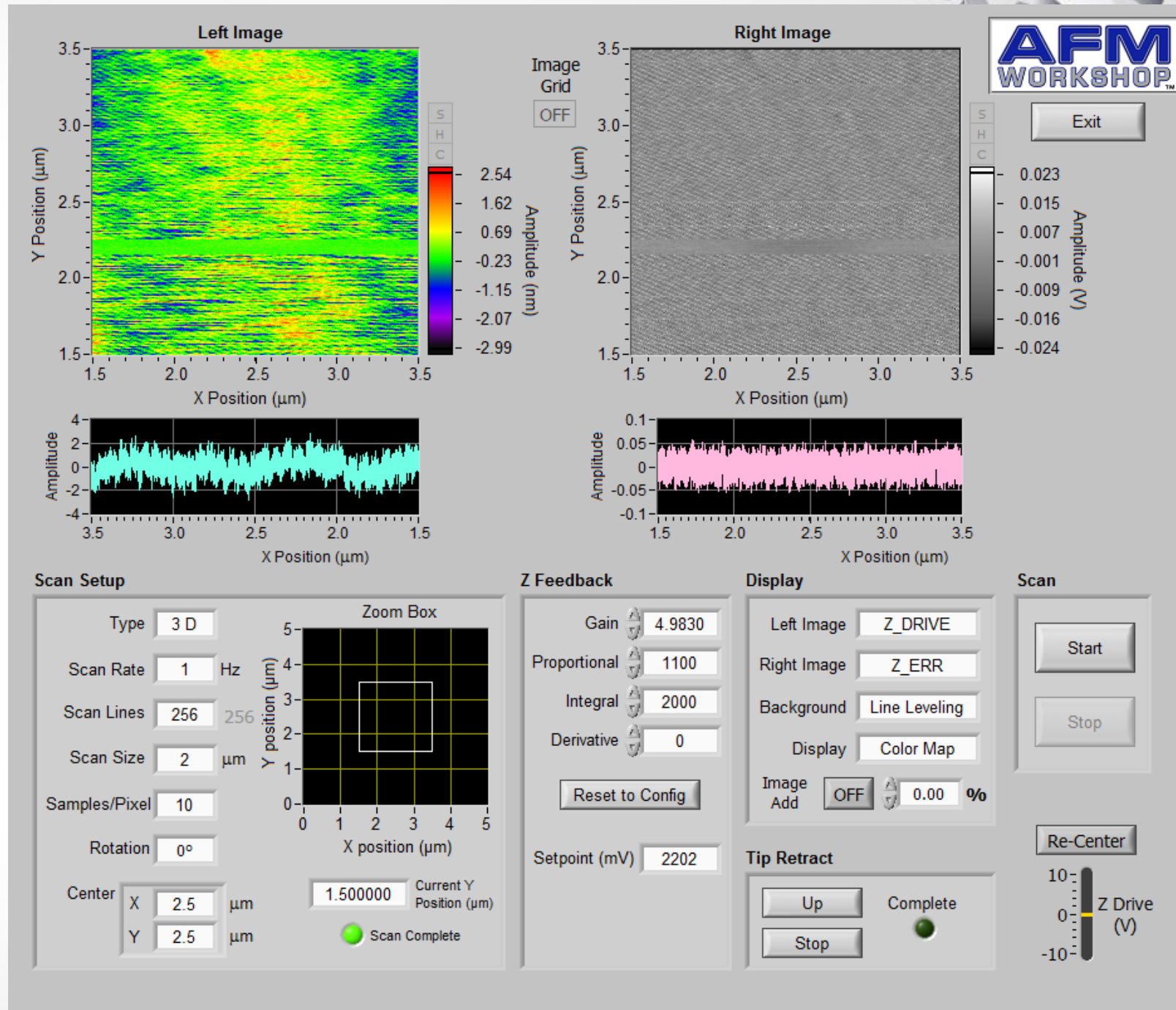
Oscilloscope Window

Scan Setup Window

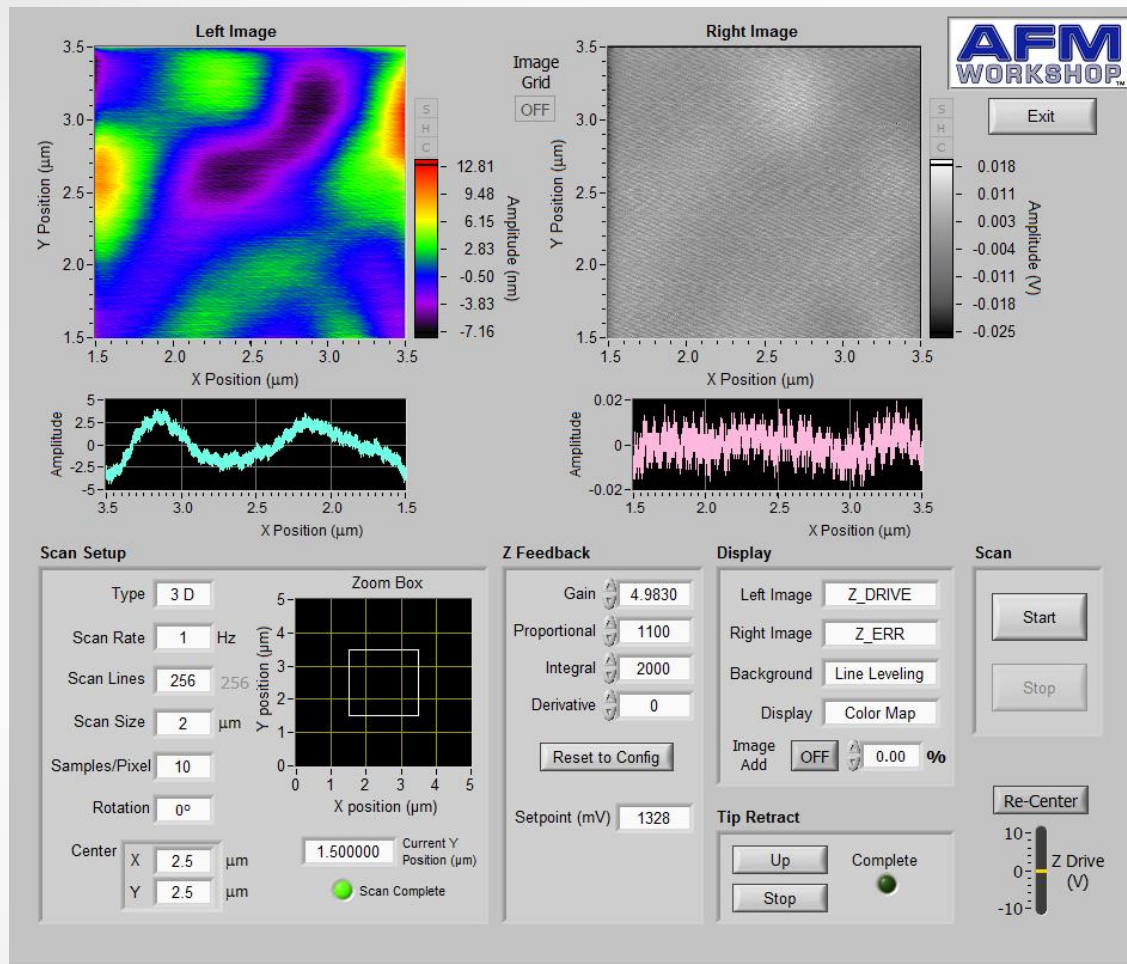


Some troubles

I know this is noise, but how to solve it?

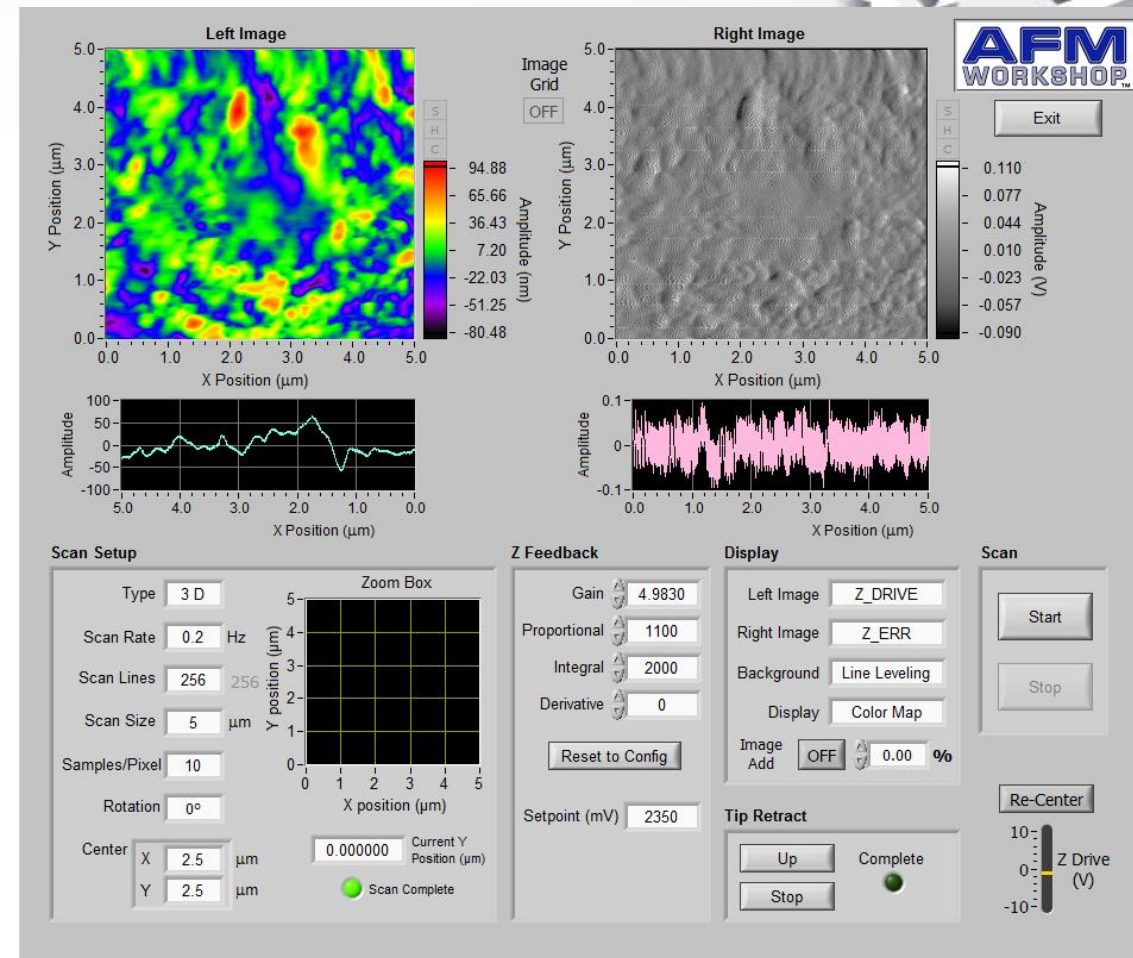


Some results



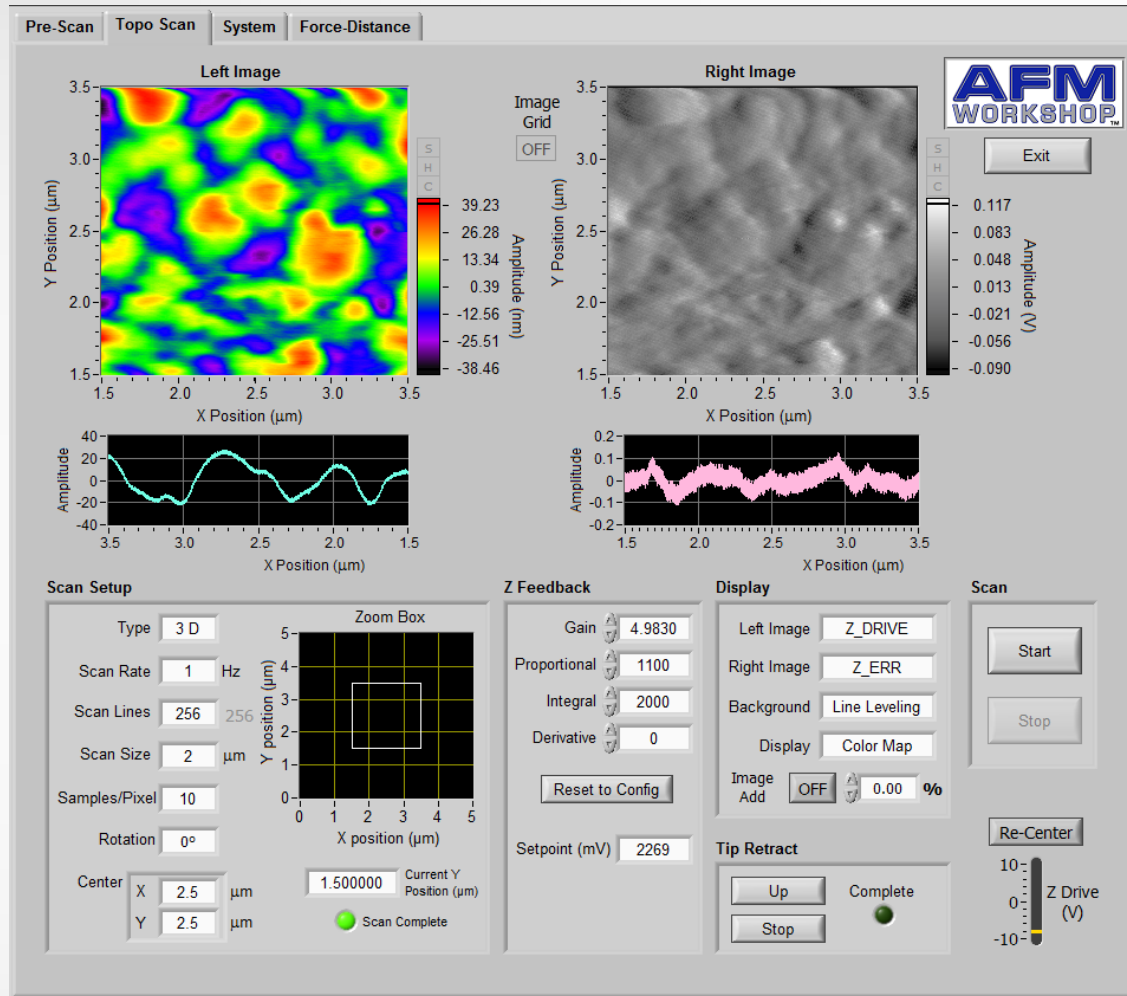
Scan size: 2µm

BIPY

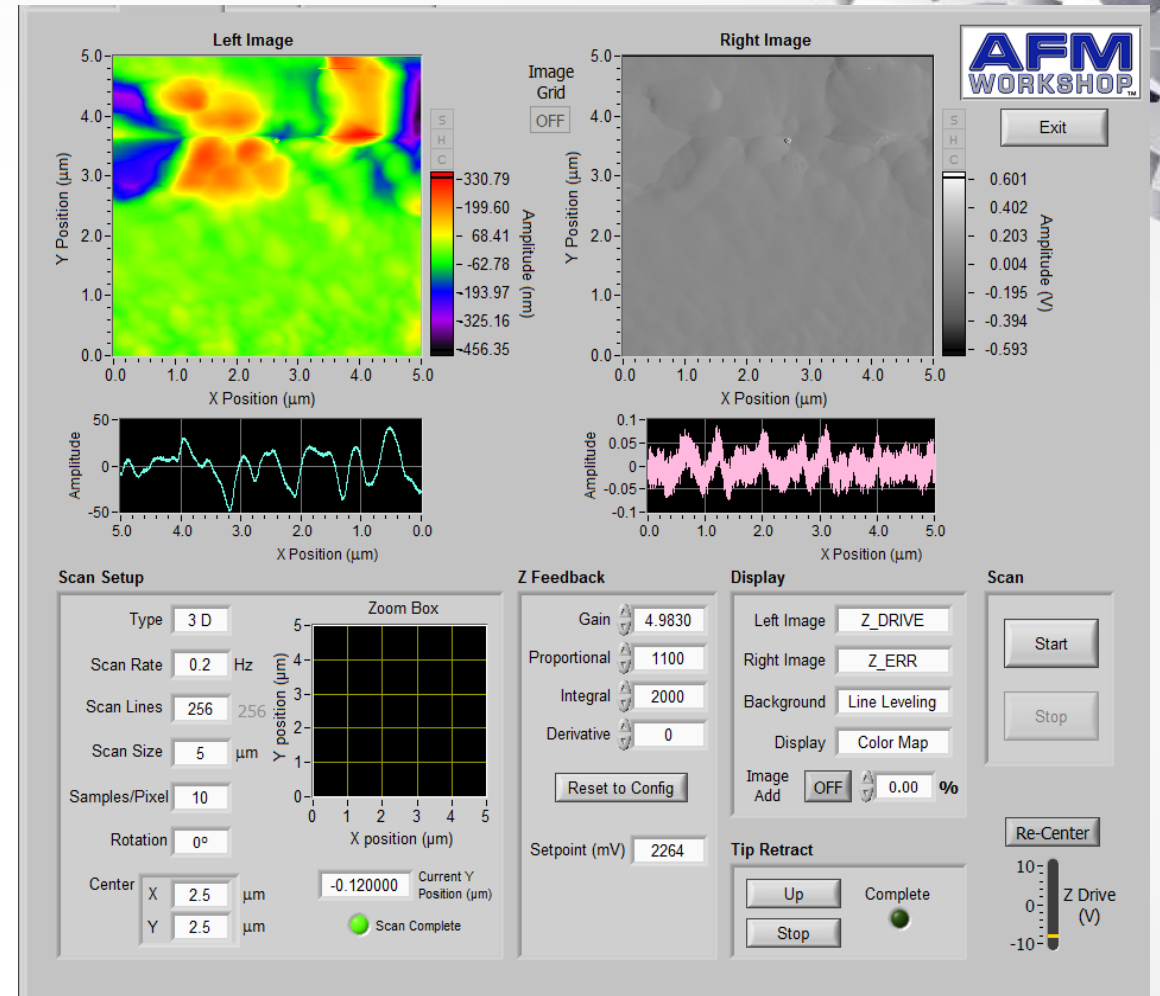


Scan size: 5µm

Some results



Scan size: 2µm



Scan size: 5µm

BIPY