

Veeco Dimension 3000 Atomic Force Microscope Users Manual



Coral name: AFM2
Model: Veeco Dimension 3000
Location: Nanofab, Building 215, Room A104
Contact: nanofab_metrology@nist.gov
Revision: 1.0

1. Log in CORAL on both clean room user list and AFM tool.
2. Turn on the Nanoscope controller, monitor and computer then start running the software.
3. Put sample on the chuck and turn on vacuum for large wafer.
4. Change tip on the workbench if necessary. (Only for the experienced user!!!).
5. Adjust the laser to the cantilever using the upper knobs to move the laser on tip head and then maximize the signal Sum.
6. Adjust the photodetector using the left side knobs to move the red dot at the crosshair to the center.
7. Tune the cantilever using Auto Tune (Resonance peak for 125um cantilever ~300kHz and for 250um cantilever ~60kHz). Target amplitude 1~2V.
8. Locate Tip
 - a. Adjust zoom for proper field-of-view.
 - b. Press Focus button on the mouse and rolling the ball to make the tip clear.
9. Focus Surface
 - a. Click on Focus Surface
 - b. Press Focus button on the mouse and then roll the ball to make the surface clear (watch the image closely to make sure the image is on the sample surface).
 - c. For transparent samples, please use the sample edge or tip reflection to focus the surface.

Do not crash tip into the sample (the travel distance for fine engage is ~200um).

10. Close the hood
11. Adjust the operation parameters.
Adjust scanning rate, image size, xy offset(< 20um), and aspect ratio.
12. Engage the tip to the surface (Auto)
 - a. Decrease amplitude if necessary.
 - b. Adjust proportional gain, and integral gain.
13. Capture the image
 - a. Give a file name
 - b. Press the camera icon on top to start
14. Once the image capture is done, raise the tip by clicking the withdraw icon one time and then repeat the process from step 12 for the next run.

Raise stage to ~1 cm after finishing the whole process.
15. Exit software, and then turn off the Nanoscope controller.
16. Log out CORAL, and record the process (e.g. sample, scanning condition etc.) in log book.