

## NATURAL SEM PROCEDURE

As soon as you are finished with the start up procedures do the following

- 1) Turn on camera so that you can see inside the chamber (use white button on front of right television screen)
- 2) Move the Robinson Detector into the chamber by unscrewing the knob on the top of the detector and lifting the bottom bar that is holding the detector to the SEM and slowly guiding it into the chamber. The vacuum will pull it slowly. Do this slowly because the detector is very sensitive. You can tell that it is inserted correctly when the housing of the detector is flush with the chamber opening.
- 3) Press the white button on the front of the right television screen to see the black left screen again.
- 3) Turn the vacuum off to empty the chamber.
- 4) Press the VACUUM SET (F2) button on the computer keyboard. Set this to N-SEM and 30pa. Everything else will be set automatically. Press the vacuum set button again to take this off the screen.
- 5) Press the BEAM CURRENT (F?) button on the keyboard and move the beam to the A of LARGE.
- 6) Load your sample as soon as the chamber is loose. The sample should be placed with nail polish on a metal peg.
- 7) Put the sample on the SEM stage. Push the door shut and switch to EVAC setting. It will take about 2 minutes to evacuate the SEM.
- 9) When the vacuum is ready, the ACC/VOLTAGE light will blink. Wait for it to stop blinking- about another minute. Turn the ACC/VOLTAGE button on.
- 10) Saturate the filament.
- 11) Remove the space between your sample and the detector. You do this by the following.
  - a) Press the focusing button to the manual setting
  - b) Press the coarse arrow key once briefly. Look at the MAG panel on the front left of the control panel.
  - c) Use the two arrows in the focusing panel to make the focal distance 11mm which is .11 on the display
  - d) Using the camera to see inside the chamber, (press the white button) move the sample towards the detector very slowly using the Z knob on the front of the chamber door.
  - e) Do this very slowly and as you move the sample up toggle back into the live image to see if your sample is in focus. .11 will be very close to the top but **DO NOT LET THE ROBINSON DETECTOR TOUCH THE PLATFORM.**
  - f) As soon as your image is pretty well focused, don't move the sample up any farther.
- 12) Go to Getting a good image but come back here after you take your picture.

- 13) When you are done with your picture, turn down the filament very slowly.
- 14) Turn off the ACC/VOLTAGE button.
- 15) USE THE Z-KNOB ON THE FRONT OF THE CHAMBER TO LOWER THE PLATFORM SO THAT THE TWO WHITE BOXES ON THE KNOB ARE EQUAL-- USE THE CHAMBER CAMERAS TO SEE THIS.
- 15) Wait 3 minutes for the filament to cool.
- 16) Release the vacuum in the chamber by pressing the VACUUM/AIR button.
- 17) When the door has loosened (about 3 minutes) take out your sample. If you are going to take more pictures go to #7.

IF YOU ARE DONE:

- 18) Reset the BEAM current so that the bar is only half full. Also, turn the N-SEM setting to the SEM setting like when you started. Pull out the Robinson detector and tighten the screw as soon as the lever on the bottom falls down.
- 19) Shut the chamber door and turn the VACUUM on again.

Turn off the display switch on the front of the SEM.

The emissions current display will be pretty low. The lower voltage will give a better surface view of the sample. A higher voltage will give you a less detailed image of the surface but may give you the kind of picture that you want (it will have a high-lighted look)