

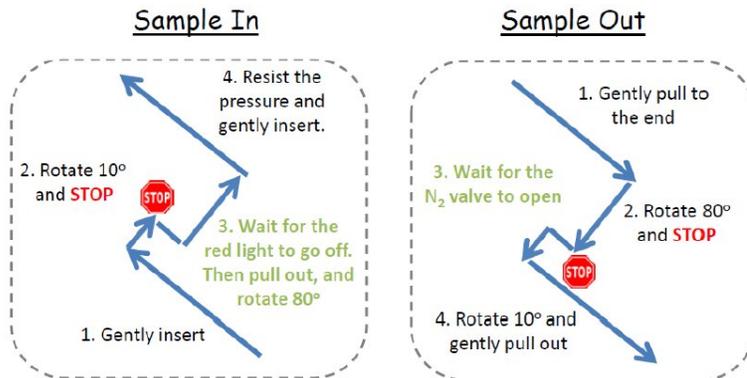
Part I: High Resolution TEM alignment

V5.0

First Check:

1. Column valve is **CLOSED** and the vacuum is good (the vacuum scheme is all green)
 - a. Upper column low $10e-9$ mBar
 - b. Middle column low $10e-6$ mBar
 - c. Lower column low $10e-6$ mBar
2. Screen is **DOWN**.
3. Stage **X,Y&Z position and tilt =0**
4. Camera is inserted and temperature is **-20 °C**

Specimen Rod removal/Insertion:



Illumination alignment:

1. **Verify the vacuum levels are all good.**
2. The system is on **TEM, Mag, ESI, BF** mode
3. **OPEN** column valve.
4. Go to standard condition: **Ill = 11, Mag = 31.5K**
5. Find your sample on the screen
6. Press **Cal** to calibrate objective lens, Press **Foc Aid**, the image starts wobbling. Use **Focus** control (now set to **Mech**) to minimize the image movement. When finished, deactivate **Foc Aid**. (Readjust the eucentric height after moving to a new region if needed)
7. Switch from TEM to Spot then press Cal to calibrate the spot. Use **Ill Shift** to center the spot if necessary.
8. Press **TEM**, adjust **Mag** and **Brightness**, use **Ill Shift** to center the beam.

Energy filter alignment:

1. Switch from **ESI** to **EELS**, make sure spectrum caustic is visible
2. Focus caustic image with “**Spot control**”
3. Center the spectrum caustic by **Spec Shift** if needed

Illumination tilt alignment

1. Under TEM tab, click Objective Wobbler, the **III Tilt** will be active
2. Adjust **X & Y** knob to minimize the wobble of the image. When finished, click Objective Wobble off.

Correct objective lens astigmatism

1. Select **magnification** and **brightness** appropriate for your sample
2. **Insert camera** if not inserted
3. Select **view** to activate the CCD image.
4. Raise viewing screen (press **M8**)
5. Click **Process\Live\FFT** in DM to get the live FFT of the viewing image.
6. Switch control to **Obj Stig**
7. Adjust **Focus** to get the first order Scherzer defocus ring.
8. Adjust **Obj Stig X & Y** to make the ring as round as possible.