

# Running with No Helium for Optics

## Conditions:

- The run plan requires very low helium to allow the beam to solely interact with the carbon disk
- Magnet is at full field, persistent mode, leads are ramped down
- Nose is over 50%, run valve in PID mode
- The carbon Target is in place
- Roughing and Bypass valve open with mechanical pumps on

## Preparation:

- With beam on (~80nA) check and remember the T1 and T3 event rate at the third person station (usually ~2.7kHz)
- Close the run valve to start emptying out the nose (the microwave can assist in this)
- Once the nose level drops below 8% you can not expect an accurate reading but having the level far below this is not beneficial
- Once you see the rates in T1 and T3 drop to ~0.9kHz then the nose has emptied enough, this is about a factor of 3 from your initial check with Helium in
- Note: You may need to get the cup temps up above 10K before you see the rate in T1 and T3 drop (a good run valve position is 0.43 at ~10K using 50nA beam current)

## Maintain:

- Once you have emptied the nose enough open the run valve to 0.3
- Keep a very close eye on the cup temperatures (lower left side of PDP screen under Cx Top and Bott)
- The cup temperatures should be between 12-19K averaging around 16K, if they get above 20K open the run valve in increments of 0.05 until they cool
- If the cup temperatures get above 30K stop the beam, if you can't cool them down call target expert
- Monitor the main flow and check that it stays above 1.0 if it drops below 1.0 this can indicate that the helium in the nose is completely gone, it is necessary to keep a flow of vapor on the target at all times, open the run valve in increments of 0.05 until you see the flow increase keeping the run valve between 0.3-0.5