Equipment

- Two 1”diameter(or greater) f=1m lenses, each with a mount which controls both angle and lens position (i.e. a 4axis or 5 axis lens mount) + stands for them
- The quad photodiode
- Control over the helicity board
- 3-5mW of Hall A laser for alignment (CW or pulsed, either is fine)
- >20uA of electron beam (preferably ~70uA, but not strictly necessary)
- (Conditions of injector beamline should be as if accelerator were going to run 70uA of 1GeV beam, or 150uA of 2GeV beam)

People – Caryn Palatchi, Sachinthani Premathilake, Ciprian Gal, Kent Paschke

Need walk-through of injector laser for Sachinthani Premathilake

- <u>Day1 benchmarking</u>
- **Morning – bcm/bpm calibration**
- *Need someone in control room who can change beam current, turn on/off autogaining on bpms*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- BCM/BPM calibration scan - 5uA steps of current up to max current, auto gaining on injector bpms off
- Autogaining of injector bpms back on
- **Afternoon – RHWP scans**
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2 hours
- Tweak Pockels cell translation – 1 hour
- Repeat 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2 hours
- **Evening –laser QPD setup**
- *Need Access to injector laser room*
- *Need someone who can get the laser to give us 3-5mW of Hall A laser beam*
- Setup pick off to QPD

- <u>Day 2 upstream lens insertion and PC re-alignment</u>
- **Morning – QPD setup, camera measurements, lens alignment**
- *Need Access to injector laser room*
- *Need someone who can get the laser to give us 3-5mW of Hall A laser beam*
- 3-5mW Hall A laser (CW or pulsed, either is fine)
- ~~Remove downstream 1m lens~~
- Finish Setup of QPD pickoff / calibration
- *CHECK PC alignment with no analyzer (steering) and Aq in S2 (do PITA scan to make sure in S2)*
- Get spiricon measure of spot size at cathode
- Repeat measure of spot size at pockels cell (will bring our own spiricon for this)
- Insert 1m lens upstream of Pockels Cell at predetermined z-position **z=…**

- measure of spot size at pockels cell (will bring our own spiricon for this)
- Measure divergence of laser at Pockels cell
- Measure spiricon spot size at cathode
- *Measure spot size at vacuum window(if possible)*
- Measure spot size at QPD
- **Afternoon – PC realignment**
- Calibrate QPD
- Check PC alignment starting point– S1, S2, no anal, RHWP scan
- Align Pockels cell
- **Evening – PC realignment (maybe RHWP scans)**
- *PC alignment*
- *(Or RHWP scans if there is time)*
- *(Need someone in control room who can change beam current, turn on/off autogaining on bpms)*
- (HallA Electron beam >20uA (70uA is good) going up to at least FC1)
- (BCM/BPM calibration scan - 5uA steps of current up to max current, auto gaining on injector bpms off)
- (Autogaining of injector bpms back on)

- <u>Day 3 PC -RHWP scans + downstream lens insertion</u>
- **Morning – RHWP scans**
- *Need someone in control room who can change beam current, turn on/off autogaining on bpms*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- BCM/BPM calibration scan - 5uA steps of current up to max current, auto gaining on injector bpms off
- Autogaining of injector bpms back on
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours
- **Afternoon – downstream lens insertion + camera measurements**
- *Need Access to injector laser room*
- *Need someone who can get the laser to give us 3-5mW of Hall A laser beam*
- 3-5mW Hall A laser (CW or pulsed, either is fine)
- Insert 1m lens downstream of Pockels Cell at predetermined z-position **z=…**
- Measure spiricon spot size at cathode
- *Measure spot size at vacuum window (if possible)*
- **Evening – bpm/bcm calibration + RHWP scans**
- *Need someone in control room who can change beam current, turn on*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours
- **decide to keep downstream lens or remove + RHWP scans**
- *Need Access to injector laser room*

- Remove 1m lens downstream of PC (if decided)

- <u>Day 4 Photocathode rotation</u>
- **Morning**
- *Need Access to injector room*
- *Need someone who can help us rotate the photocathode Angle #2*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- *Need someone in control room who can change beam current, turn on/off autogaining on bpms*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- BCM/BPM calibration scan - 5uA steps of current up to max current, auto gaining on injector bpms off
- Autogaining of injector bpms back on
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours
- **Afternoon**
- *Need Access to injector room*
- *Need someone who can help us rotate the photocathode Angle #3*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours
- **Evening**
- *Need Access to injector room*
- *Need someone who can help us rotate the photocathode Angle #4*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours

- <u>Day 5 Photocathode rotation final</u>
- **Morning/Afternoon/Evening**
- *Need Access to injector room*
- *Need someone who can help us rotate the photocathode FINAL ANGLE*
- HallA Electron beam >20uA (70uA is good) going up to at least FC1
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours
- PC translation to optimize
- 4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2-4 hours

- ~~Day2 downstream lens insertion~~
- ~~**Morning**~~
- ~~*Need Access to injector laser room*~~
- ~~*Need someone who can get the laser to give us 3-5mW of Hall A laser beam*~~
- ~~3-5mW Hall A laser (CW or pulsed, either is fine)~~

- ~~Insert 1m lens downstream of Pockels Cell at predetermined z-position (personal preference is upstream of clean-up polarizer, but only Hall A laser spot size will be affected)~~
- ~~Measure spiricon spot size at cathode~~
- ~~**Afternoon**~~
- ~~*Need someone in control room who can change beam current*~~
- ~~HallA Electron beam >20uA (70uA is good) going up to at least FC1~~
- ~~4 RHWP scans (IHWP in/out PITA 0/ PITA non-zero) – 2 hours~~